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Computer Management of Fish Health Problems in Hatcheries

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Contents

Page

Abstract / Résumé iv

Introduction 1

Program Description 1
- Introductory Notes 1
- Anesthetics 2
- Chemical Notes 2
- Disinfectants 3
- Case Reporter 3
- Disease Treatment 4

Equipment / Program Source 4

Acknowledgments 4

Appendix I. Hard Copy of the Case Report 5

Appendix II. Program Matrix 9

Appendix III. Route of Administration and Recommended Dosage for Each Treatment Entered in the Program 12

Appendix IV. Hard Copies of Subprograms: Fish Health and Case Reporter 14
- Fish Health 14
- Case Reporter 29

Abstract

HOSKINS, G. E., C. J. WEST, AND A. E. KLING. 1983. Computer management of fish health problems in hatcheries. Can. Spec. Publ. Fish. Aquat. Sci. 68: 42 p.

A computer program designed to assist fish culturists with the control and treatment of hatchery diseases, especially diseases of Pacific salmon, is described. Following diagnosis of an infectious disease by a fish health specialist, the program will assist in selection of the appropriate treatment procedure, perform all of the necessary calculations, and outline the method of application. A subprogram designed to assist hatchery personnel in recording the occurrence of fish health problems is also described. The program is written in the "Applesoft" version of the BASIC language; $5^1/_4$-inch floppy disk copies are available for a limited period.

Résumé

HOSKINS, G. E., C. J. WEST, AND A. E. KLING. 1983. Computer management of fish health problems in hatcheries. Can. Spec. Publ. Fish. Aquat. Sci. 68: 42 p.

La présente publication spéciale contient une description d'un programme machine conçu dans le but d'aider les pisciculteurs à contrôler et à traiter les maladies dans les établissements d'élevage, surtout les maladies des saumons du Pacifique. Une fois une maladie infectieuse diagnostiquée par un spécialiste de la santé des poissons, le programme aidera à choisir le traitement approprié, fera tous les calculs nécessaires et décrira la méthode d'application. On décrit un sous-programme qui aidera le personnel des établissements de pisciculture à enregistrer l'occurrence des problèmes sanitaires des poissons. Le programme est présenté dans la version "Applesoft" du BASIC; on peut se procurer des copies, pour une période limitée, sur disquettes de $5^1/_4$ po.

Introduction

In fish culture facilities where millions of animals are reared, the control of infectious disease is a major concern. It is made difficult by unavoidable hatchery practices such as crowding, handling, tagging, and transporting; combined, these result in stresses that predispose fish to infection by a long list of infectious agents. The problem is further compounded by the rapidity and ease with which the causative organisms can spread in the aquatic environment. Nevertheless, to be effective, disease control must be an integral and daily part of hatchery life.

In British Columbia, the federal Department of Fisheries and Oceans operates more than 35 facilities engaged in the intensive rearing of salmonids, mainly Pacific salmon (*Oncorhynchus* spp.). Under the high production levels necessary, disease control is essential to the success of these facilities. Many factors influence the options by which disease problems can be managed. For instance, in this province, factors such as species reared, diet, water quality, hatchery design, and pond densities vary considerably between sites. More important, rearing conditions frequently change to meet developing fisheries management strategies and policies. The end result is that standard tables for the application of chemical treatments in the event of disease outbreaks are not entirely practical. Frequently changing conditions require special calculations and application methods for every treatment.

Further, the use of chemicals in fish culture is unavoidable. Recent findings of the Diagnostic Service, Pacific Biological Station, Nanaimo, B.C., indicate that many infectious agents that occur naturally in the province have a wide distribution. For most facilities, avoidance of the causative agent is neither possible nor practical. Instead, the fish culturist must rely upon those management techniques that maximize fish health through minimization of the disease promoting stress. However, when these fail or are not possible, it becomes necessary to use prophylactic treatments, or worse, to combat active disease outbreaks.

Another factor or problem is that the use of the chemicals, drugs, and antibiotics reported in the literature may result in additional losses if not administered correctly at dosages adjusted to local conditions. Many chemical treatments were developed for use in hard water areas of the United States or Europe on either domestic trout, carp, or other species of which many are not native to this province. Experience has shown that salmonids in British Columbia's soft coastal water are very susceptible to the adverse effects of many chemotherapeutic agents, especially when the fish are already weakened by an infectious disease.

Perhaps the major factor encountered at many facilities is the difficulty of administering a chemotherapeutic agent to a raceway or pond containing hundreds of thousands of animals or, in a few cases, millions of animals. The difficulty arises, in part, from a lack of standardization in pond design as well as the need to change rearing techniques frequently. The result is that the fish culturist is faced with a seemingly endless array of procedures, alternate chemicals, units, concentrations, and environmental conditions. In addition, the culturist must be fully aware of the physiological impact of the chemical used. For instance, the use of Diquat on smolts may destroy their ability to adapt to salt water. Most important, the calculations must be exact or disaster may result.

To overcome many of these problems, this publication presents two closely linked computer programs, specifically designed to assist the salmonid culturist in British Columbia in managing fish health problems, including the selection of appropriate remedial measures. The programs offer a high degree of standardization in a systematic, calculable approach to disease prevention and control. As well, they have proven to be valuable training aids to hatchery personnel and students of fish culture. They are designed primarily for production facilities rearing Pacific salmon in British Columbia and not for foodfish farms, where fish might be harvested within a month of treatment. However, both programs can be modified for application to other species and locations. Because, when combined, they form an ideal fish health management program, they will be considered as a single program for the purpose of this paper. Both are written in the Applesoft version of the BASIC language of computers and are designed to run on the Apple II, 48k microcomputer. In British Columbia, most federal fish culturists and biologists have direct access to this computer.

Program Description

The two programs are entitled "Case Reporter" and "Fish Health." Combined, they have four primary functions: (1) to assist the fish culturist with selection of the appropriate treatment, anesthetic or disinfectant; (2) to perform the necessary calculations; (3) to assist in the documentation and reporting of hatchery fish health problems; and (4) to provide information on the handling, storage, and use of various chemotherapeutic agents. Areas of hatchery disease management in which the system has an effective role are illustrated by the flow chart in Table 1. For ease of use the programs are organized into a single, six-sectioned menu as:

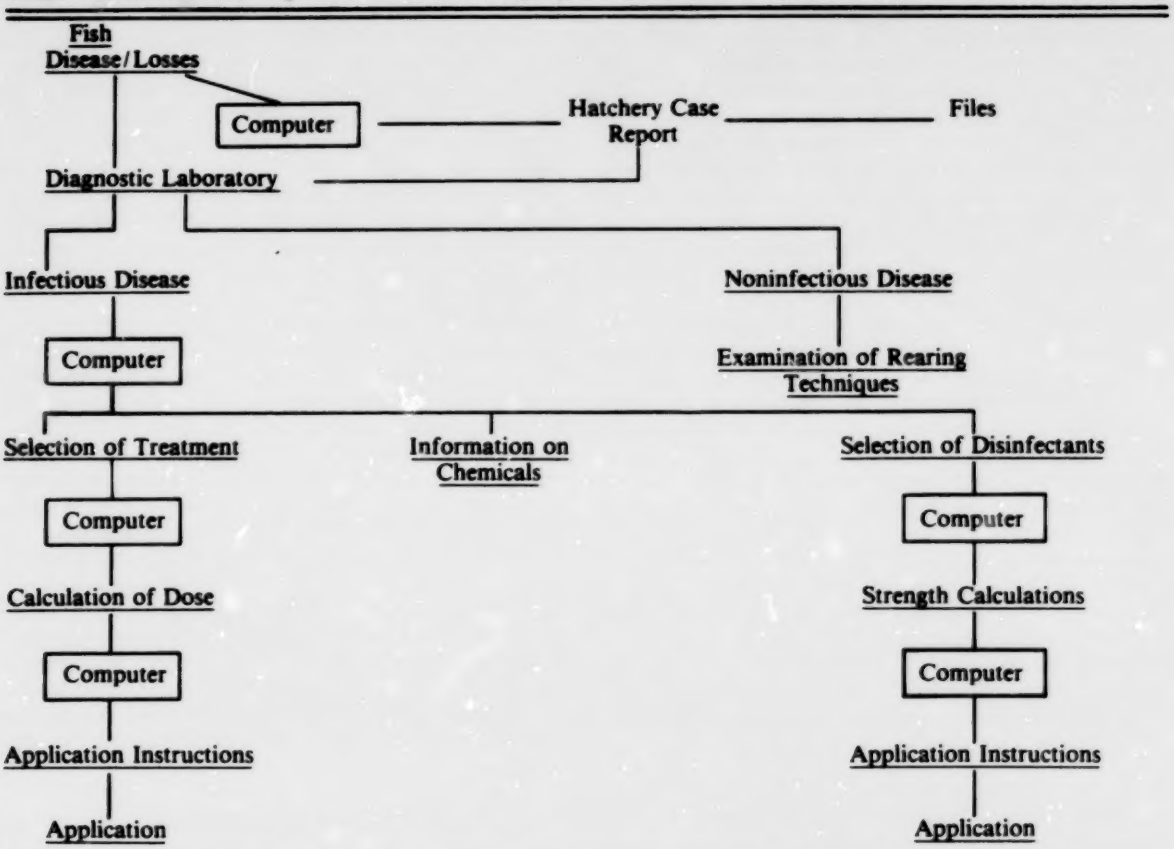
1. Introductory notes
2. Anesthetics
3. Chemical notes
4. Disinfectants
5. Case reporter
6. Disease treatment

Each section is explained in greater detail below. In most cases one or two "dry runs" through each section of the menu is all that is required to become sufficiently familiar with the system to use it effectively.

Introductory Notes

This is essentially a brief introduction to the program outlining its purpose and identifying special function keys on the keyboard. Operation is simple; all incorrect

TABLE 1. Flow chart showing those areas where the program can be effectively used to assist in fish health programs.



entries are ignored and the "Ctrl" (control) key can be used when any of the following appear on the video monitor:

1. OK (Y/N)?
2. SELECT?
3. (PRESS ANY KEY TO CONTINUE)
4. STANDARD DOSE OK?
5. AI's OK?

By simultaneously pressing the "Ctrl" and "R" keys, the operator can return to the menu from anywhere within the programs. If a printer is available, any screen display can be copied by simultaneously pressing "Ctrl" and "P" keys. Any keyboard entry can be changed by entering "N" when OK(Y/N)? is displayed. This repeats the last series of questions. When STANDARD DOSE OK? occurs, the dosage level can be changed to meet specific requirements; otherwise a standard preprogrammed dosage is assumed. When AI's OK? is displayed, the amount of active ingredient (AI) can be altered to agree with that of the product selected for use.

Anesthetics

Although not strictly related to diseases, this section is included as a convenience. It performs all required calculations necessary to prepare anesthetic baths for immobilization of fish. Three commonly employed anesthetics are included, carbon dioxide, MS222, and 2-phenoxyethanol; others can be added if required. Carbon dioxide is included since hatchery procedural rules prohibit the use of other chemicals on fish that are destined for immediate human consumption. For those cases where lethal sampling is desired, and the fish are not for human consumption, the amount of MS222 necessary to kill fish quickly can be calculated.

Use of this section is simple and details need not be given. Following selection of one of the anesthetics, the user is asked for either the shape and dimensions of the container or its volume. For both volume and dimension, any one of five different units of measurement is permitted. Once the amount of active ingredient in the product being used is confirmed, the program calculates the amount of product required and summarizes preparation of the bath. The program cannot consider all possible variables that may influence the actual degree of immobilization achieved; therefore, it is advisable always to test the bath first with a small lot of fish.

Chemical Notes

This section is basically a listing of the chemical notes used elsewhere in the program. It is primarily intended as a guide to storage, handling, and toxicity but other information may be included. The inclusion or recommended use of a chemical is based upon a reasonably

high degree of:

1. freedom from toxicity to fish in soft water;
2. freedom from toxicity to humans and ecologic damage;
3. efficacy;
4. availability as well as low cost.

All therapeutic drugs, whether hormones, anesthetics, antibiotics, or other substances, should be administered carefully with a definite purpose in mind. The old "shotgun" or "measure-as-you-go" approach is no longer acceptable in today's high production–high technology facilities. Further, the impact of spent drugs on the environment must always be considered. Certain safeguards are built into the program; for instance, the use of formalin at elevated water temperatures is not permitted. Hyamine and Roccal are also included for use on fish but recommendations to limit their use for disinfection of hatchery equipment only are also included.

Disinfectants

As every hatchery person is aware, the effective use of disinfectants is a key element in the control of infectious disease. Use of the program can help to avoid under- or overstrength disinfectant solutions that may be totally ineffective or corrosive to equipment. After entering this section, any one of seven general purpose, commercially available products can be selected. To calculate solution strength, the same program segment used for the anesthetics is employed. Therefore, questions asked by the program and video displays are similar to those for the anesthetics.

It should be noted that one of the safest, yet most effective, disinfection procedures available to the fish culturists is to rinse nets and utensils in clean, uncontaminated water, and to allow them to dry in full sunlight.

If immediate disinfection is required, the program gives two sources of chlorine: HTH (calcium hypochlorite) and household bleach. Special instructions accompany the use of chlorine. Because of its corrosive nature and high toxicity to fish, its handling and disposal demand special care. All chlorine solutions should be neutralized with sodium thiosulfate before disposal.

Use of this section is straightforward and requires no special notes. As with most of the program, a few minutes of use will sufficiently acquaint hatchery personnel with this section.

Case Reporter

Accurate reports on hatchery conditions, fish behavior, and gross disease signs are essential to determine the primary cause of fish health problems. Often, useful clues can be obtained from this information on what investigative procedures are required. In some cases fish behavior and gross disease signs are highly diagnostic; for instance, death accompanied by flared opercula strongly indicates severe gill irritation or acute oxygen depletion, whereas excess gill mucus may indicate low water pH or cyanide poisoning. Data such as mortality patterns, even over short periods, can indicate what type of agent may be responsible — parasitic, nutritional, bacterial, viral, or environmental.

This section utilizes only the "Case Reporter" subprogram and runs independently of the rest of the program. Its main function is to assist hatchery employees in recording events and conditions surrounding a health problem. in all such cases, the maintenance of complete records is desirable. Following completion of the report, hard copies can be printed to accompany fish samples to the diagnostic laboratory as well as for hatchery files. A blank case report is shown in Appendix I to illustrate the type of information that has the greatest value in attempting to unravel the cause of losses.

An eight-item menu organization is used to manage this subprogram:

1. Input case report
   — leads user through a series of questions resulting in a complete case report
2. Review report
   — allows the completed report to be examined for errors and omissions, and corrections to be made before hard copying or storage
3. Hard copy report
   — produces a hard copy of the completed report when the user's system is appropriately equipped with a printer
4. Store report
   — stores the completed report on floppy disk
5. Recall report from disk
   — allows any report stored on floppy disk to be recalled by name
6. Return to disease menu
   — returns to the main disease management menu
7. Hard copy blank form
   — directs the printer to print a blank copy of the report which can be used remotely from the computer
8. Return to utility menu
   — returns to the utility menu listing all other fish culture and hatchery management programs available on the disk

Case reports prepared with the assistance of the case reporter are in a format readily available for further machine analysis and manipulation. Data stored on floppy disks are available to the hatchery manager for uses such as monthly reports or for monitoring changing patterns of disease occurrence within the facility. Minor changes in rearing and handling procedures can often have serious consequences for fish health. To analyze the cause and effect relationships, complete records on each case are essential; use of the reporter ensures completeness of relevant information by confronting the user with questions.

Use of the program is straightforward. The user is directed to answer a series of three or four questions; as each series is answered, another appears on the monitor. To minimize typing, a list of answers is given whenever possible, and the user can simply enter a number corresponding to the appropriate answer in the list. For essential data, such as date and location, the program will

not continue until the requested information is entered. Other questions can be ignored by pressing "return." Upon completion, the report should be placed on a floppy disk for permanent storage.

Disease Treatment

Besides carrying out all calculations, this segment of the program is designed to assist the fish culturist with the selection of all disease control and prevention measures. It is most effective when an accurate diagnosis, obtained as soon as possible following the first signs of a problem, is available. Speed is important especially during acute outbreaks of infectious diseases. Furunculosis, for example, responds best to Terramycin if the antibiotic is administered early, before high losses occur, and the fish have stopped feeding. However, no treatment should be undertaken without a definite, well-defined reason or a definite diagnosis. Moreover, prophylactic treatments should be used only when a threatening agent is known to be present.

Use of this section is simple. The 24 most frequently encountered infectious diseases in British Columbia are listed in a menu. Following selection of one, the user is asked to enter fish age, whether disease control or prevention is desired and, in some cases, the water temperature. Depending upon user responses, a list of one to four treatments is displayed with the preferred treatment always listed first. In the use of antibiotics, the program assumes that the diagnostician will have advised the fish culturist on the drug sensitivity of the bacterial agent involved.

The matrix upon which the treatment selection is based is given in Appendix II. This is a useful reference in understanding the program's organization and what it considers in choosing a treatment. The dosage levels within the matrix are given in Appendix III. Personnel who do not have access to an Apple microcomputer will find both appendices useful in planning their treatment schedules.

When the computer and user have selected a treatment, the mode of application is outlined with important precautions and other notes. The user is then asked for sufficient information to allow the treatment levels to be calculated. In all cases, standard treatment levels in strength and time are assumed unless otherwise altered by the user.

The methods of treatment application available to the computer are:

Dip — 1–10 min exposure to relatively high levels of chemicals
Static bath — 1-h exposure to moderate levels of chemicals
Flush — short, single pass of chemicals of varying strength
Long bath — extended periods of exposure to low concentrations of chemicals
Oral — administered with food
Injected — substance applied by injection into the dorsal sinus
Vaccine — normally a short dip in diluted vaccine as directed by the manufacturer's instructions

Selection of chemicals is primarily based on the diagnosis, fish age, and whether the disease is to be treated or prevented. Chemicals that do not have a high degree of predictability in fish response or do not affect all salmonids in the same manner and to the same degree are not included in the matrix. The final product is a video summary of all entries and a basic procedure for preparation of the necessary stock solutions, setting of dosing pump speed, etc. which can be hard copied for hatchery files and submission to supervisors.

Equipment/Program Source

For hardware, it is necessary to have a reasonably powerful system. Although, as described herein, the program is designed to run on an Apple II Plus microcomputer, a programmer skilled in the BASIC language should be able to adapt it to other systems with no great difficulty. A reasonable system will consist of:

— microcomputer, 48k memory
— two disk drives
— a monitor with a green phosphor, matte finish
— printer
— numeric key pad

For those wishing to examine the program's structure and organization or to adapt it to another machine, the subprograms are presented in hard copy in Appendix IV.

The program is also available on a $5^1/_4$-inch floppy disk suitable for running in a 48k Apple microcomputer. Disks can be ordered from the Canadian Government Publishing Centre, Ottawa, Ont., Canada K1A 0S9 (Canada $40.00, Other countries $48.00).

The authors would appreciate receiving any comments or suggestions for improvements, as well as notification of any program errors.

Use of the following trade names in this publication does not necessarily imply endorsement of the product by the authors:

	Active Ingredient
Betadine	povidone–iodine
Diquat	herbicidal chemical
Furanace	nifurpirinol
Gallimycin	erythromycin
HTH	calcium hypochlorite
Hyamine	benzaikonium chloride
MS222	tricaine methane sulfonate
Ovadine	povidone–iodine
Roccal	benzalkonium chloride
Terramycin	oxytetracycline
Wescodyne	povidone–iodine

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Appendix I. Hard Copy of the Case Report

CASE REPORTER

DATE : _____
SAMPLE SITE : _____
CONTRIBUTOR : _____
SPECIES : *_____
AGE : *_____
LENGTH (MM) : _____
WEIGHT (GM) : _____
SEX : *_____

REASON FOR SUBMISSION: *_____
DATE COLLECTED : _____
STOCK ORIGIN : *_____

		LOSSES	WATER TEMP 'C
TODAY'S	(7)	_____	_____
PAST WEEK	(6)	_____	_____
	(5)	_____	_____
	(4)	_____	_____
	(3)	_____	_____
	(2)	_____	_____
	(1)	_____	_____

SPECIES OPTIONS	AGE OPTIONS	SEX OPTIONS
COHO	EGGS	FEMALES
CHINOOK	SAC FRY	MALES
SUMMER CHINOOK	FRY (BUTTONED)	MIXED
FALL CHINOOK	ADVANCED FRY	UNKNOWN
SOCKEYE	YEARLING	
CHUM	2 YEAR	
PINK	3 YEAR	
SUMMER STEELHEAD	4 YEAR	
WINTER STEELHEAD	IMMATURE ADULT	
DOLLY	RIPE ADULT	
RAINBOW	SPENT ADULT	
CUTTHROAT	JACK	
OTHER	OTHER	

SUBMISSION REASONS	STOCK ORIGIN
HATCHERY LOSS	WILD
FISH KILL IN WILD	CULTURED
RESEARCH	SEMI-WILD
HEALTH CHECK	UNKNOWN
CERTIFICATION	
OTHER	

CASE REPORTER
==========

SAMPLE SIZE : _____
SAMPLE TYPE : *_____
NO. AFFECTED CONTAINERS : _____
CONTAINER I.D. : _____
CONTAINER TYPE : *_____
SIZE WIDTH : _____
LENGTH : _____
DEPTH : _____
DIAMETER : _____
UNKNOWN : _____
LOAD (FISH/CONTAINER) : _____
POND INFLOW : _____
POND VELOCITY : _____

DIET : *_____
DIET TYPE : *_____
FEED RATE : _____
(% OF BODY WEIGHT)
FEEDING METHOD : *_____
PELLET SIZE : _____

SAMPLE TYPE	CONTAINER TYPE
LIVE	BURROWS
DEAD	CIRCULAR
MORIBUND	RACEWAY
RANDOM	NET PENS
MIXED	KEEPER POND
OTHER	TROUGHS
	CAP TROUGH
	SPAWNING CHANNEL
	EARTH POND
	HEATH TRAY
	GRAVEL BOX
	NATURAL
	OTHER

DIET	DIET TYPE	FEEDING METHOD
OMP	WET	HAND
BIODIET	DRY	MACHINE
SIVERCUP	MIXED	NATURAL
RANGERS		
ABERNATHY		
APEX		
RESEARCH		
CUSLAN		
NATURAL		
NONE (STARVATION)		
OTHER		

CASE REPORTER
==========

BEHAVIOR : *_____
GROSS SIGNS : *_____
RECENT HANDLING : *_____
PREVIOUS DIAGNOSIS : _____
DIAGNOSTICIAN : _____
DIAGNOSIS : _____
PREVIOUS MEDICATION : _____
VACCINATION : _____

FOR PREVIOUS DIAGNOSIS, PREVIOUS MEDICATION AND
VACCINATION FILL IN DATES IF DONE

WATER SOURCE : *_____
SALINITY : _____
DISSOLVED OXYGEN : IN : _____
OUT : _____
TGP : _____
HARDNESS : *_____
PH : _____
NH3 : _____

BEHAVIOR	GROSS SIGNS	RECENT HANDLING
NORMAL	NORMAL	SORTING
NOT FEEDING	DARK	TAGGING
ON SURFACE	POPEYED	SAMPLING
ON OUTLET	OPEN LESIONS	MOVING
SLUGGISH	BLUE COLOUR (SPOTS)	GRADING
MORIBUND	SCALE LOSS	RESEARCH
DEAD	HEMORRHAGING	
	FIN ROT	
	FIN EROSIONS	
	RED VENT	
	RED MOUTH	
	PARASITES	
	FUNGUS	
	OTHER	

WATER SOURCE	WATER HARDNESS
SURFACE	EXTREMELY SOFT
WELL	VERY SOFT
RIVER	SOFT
CITY	MODERATE
LAKE	HARD
SALT	VERY HARD
BRACKISH	EXTREMELY HARD

COMMENTS

Appendix II. Program Matrix

Diagnosis	Treatment	Application	Adult fingerling	Fry	Sac Fry	Egg	Prevention	Cont.
Epistylis	Formalin-malachite green	Long bath	x	x			x	x
	Formalin	1-h bath	x	x				x
Hexamita	None	—	x	x	x		x	x
Glochidia (Parasitic larval clam)	None	—	x	x	x		x	x
Fungus	Malachite green	Long bath	x	x	x			x
	Malachite green	Flush				x	x	x
	Malachite green	Dip	x					x
	Formalin-malachite green	Long bath	x	x			x	x
	Formalin	1-h bath	x	x				x
	Formalin	Flush				x	x	
	Potassium permanganate	1-h bath	x	x	x		x	
Motile Aeromonad Septicemia	Terramycin	Oral	x	x	x			x
	Furazolidone	Oral	x	x	x			x
	Ovadine	Dip				x	x	
	Betadine	Dip				x	x	
Gyrodactylus	Formalin-malachite green	Long bath	x	x			x	x
Costia (*Ichthyobodo*)	Formalin-malachite green	Long bath	x	x			x	x
Cryptobia	None	—	x	x			x	x
Trichodina	Formalin-malachite green	Long bath	x	x			x	x
	Formalin	1-h bath	x	x				x
Salmincola	None	—	x	x	x		x	x
Trichophrya	Formalin-malachite green	Long bath	x	x			x	x
	Formalin	1-h bath	x	x				x
Ichthyophthrius ("Ich")	Formalin	1-h bath	x	x				x
	Formalin-malachite green	Long bath	x	x			x	

Appendix II (continued)

Diagnosis	Treatment	Application	Adult fingerling	Fry	Sac Fry	Egg	Prevention	Control
Vibriosis	Vaccine	Dip		x	x		x	
	Terramycin	Oral		x	x			x
	Furazolidone	Oral	x	x				x
	Sulfamethazine + Furazolidone	Oral	x	x				x
	Sulfamerazine	Oral	x	x	x			x
Enteric Redmouth Disease	Vaccine	Dip		x			x	
	Terramycin + sulfamerazine	Oral	x	x	x			x
	Furazolidone + sulfamerazine	Oral	x	x	x			x
	Terramycin + sulfamethazine	Oral	x	x	x			x
	Terramycin	Oral	x	x	x			x
	Ovadine	Dip				x	x	
	Betadine	Dip				x	x	
Columnaris Disease	Terramycin	Oral	x	x	x			x
	Furanace	Static bath		x	x			x
	Furazolidone	Oral	x	x	x			x
Sporocytophaga	Terramycin	Oral	x	x	x			x
	Furazolidone	Oral	x	x	x			x
	Furazolidone + sulfamethazine	Oral	x	x	x			x
Tuberculosis	None	—	x	x	x		x	x
Pseudomonas Infection	Terramycin	Oral	x	x	x			x
	Ovadine	Dip				x	x	
	Betadine	Dip				x	x	
Bacterial Gill Disease	Potassium permanganate	1-h bath	x	x	x		x	x
	Terramycin	Oral		x	x			x
	Roccal	1-h bath	x	x				x
Coldwater Disease	Terramycin	Oral	x	x	x			x
	Furazolidone	Oral		x	x			x
	Sulfamerazine	Oral		x	x			x
	Sulfamethazine	Oral		x	x			x

Appendix II (concluded)

Diagnosis	Treatment	Application	Adult fingerling	Fry	Sac Fry	Egg	Prevention	Control
Furunculosis	Terramycin	Oral	x	x	x		x	x
	Furazolidone	Oral	x	x	x			x
	Sulfamerazine	Oral	x	x	x			x
	Sulfamethazine	Oral	x	x	x			x
	Sulfamethazine + Terramycin	Oral	x	x	x			x
	Terramycin	Injected	x				x	x
	Ovadine	Dip				x	x	
	Betadine	Dip				x	x	
Bacterial Kidney Disease (BKD)	None	—	x	x	x			x
	Erythromycin	Injected	x				x	
	Gallimycin	Static bath				x	x	
	Erythromycin	Oral	x	x			x	
	Betadine	Dip				x	x	
	Ovadine	Dip				x	x	
Myxobacterial Gill Disease	Potassium permanganate	1-h bath		x	x		x	x
	Terramycin	Oral		x	x			x
	Furanace	Static bath		x	x		x	x
	Roccal	1-h bath	x	x				x
Fusiform Gill Disease	Potassium permanganate	1-h bath		x	x		x	x
	Terramycin	Oral		x	x			x
	Furanace	Static bath		x	x			x
	Terramycin	Static bath	x	x	x		x	x

Appendix III. Route of Administration and Recommended Dosage for Each Treatment Entered in the Program

Treatment	Application	Dose[a, b]
Terramycin	Oral	3 g/100 lb of fish for 10 d
	Static bath	2 ppm on 3 consecutive d
	Injection	7.5 mg/lb of fish
Furazolidone	Oral	3 g/100 lb of fish for 14 d
Furanace	Static bath	1–2 ppm on one occasion
Roccal	Bath	1 ppm on one occasion
Erythromycin	Oral	4.5 g/100 lb of fish for 21 d
	Static bath	2 ppm on 3 consecutive d
	Injection	10 mg/lb of fish
Sulfamerazine	Oral	5 g/100 lb of fish for 14 d
Sulfamethazine	Oral	5 g/100 lb of fish for 14 d
Terramycin + sulfamerazine	Oral	2 g/ 100 lb of fish for 14 d 3 g/
Terramycin + sulfamethazine	Oral	2 g/ 100 lb of fish for 14 d 3 g/
Furazolidone + sulfamerazine	Oral	2 g/ 100 lb of fish for 14 d 3 g/
Furazolidone + sulfamethazine	Oral	2 g/ 100 lb of fish for 14 d 3 g/
Formalin	Bath	100 ppm for 1 h on one occasion
	Bath	25 ppm for 8 h on three occasions
	Bath	250 ppm flush on one occasion
Malachite green	Bath	1.0 ppm for 1 h on one occasion
	Bath	0.5 ppm for up to 8 h on one occasion
	Bath	5.0 ppm flush on one occasion
	Dip	20 ppm for 1 min on one occasion
Formalin + malachite green	Bath	25 ppm/ for up to 12 h on 3 0.1 ppm/ consecutive d
Vaccine	Dip	Apply as directed
Potassium permanganate	Bath	1 ppm for 1 h on 2 consecutive d
Ovadine (eggs)	Dip	100 ppm for 10 min on one occasion
Betadine (eggs)	Dip	100 ppm for 10 min on one occasion
Wescodyne (eggs)	Dip	100 ppm for 10 min on one occasion

Appendix III (concluded)

Treatment	Application	Dose[a, b]
Disinfection		
Roccal	— 600 ppm	
Hyamine	— 600 ppm	
Wescodyne	— 400 ppm	
Ovadine	— 400 ppm	
Betadine	— 400 ppm	
HTH	— 158 ppm - Equipment, 25 ppm - Ponds	
Bleach	— 158 ppm - Equipment, 25 ppm - Ponds	
Anesthetics		
MS222	— 75 mg/L of water for general use	
	— 400 mg/L of water to kill fish	
2-phenoxyethanol	— 1:5000 for general use	
Carbon dioxide	— 400	

[a] All dosages are given in the amount of active ingredient required to achieve the desired results.

[b] Program users are cautioned that metering stock solutions into containers with low exchange rates may not achieve the desired treatment concentrations and exposure times. Under these circumstances, before metering in the stock solution, it may be advisable to bring the container to the desired treatment concentration using the static bath procedures. It may also be advisable to terminate the treatment by rapidly dropping the water level and refilling with chemical free water.

Users are further cautioned that inflow rates and metering pump speeds must be compatible. Otherwise the program will recommend unattainable concentrations of stock solutions.

Appendix IV. Hard Copies of Subprograms: Fish Health and Case Reporter

Fish Health

```
90  REM  ###  FISH HEALTH  JULY 6,1983  ###
91  REM  ###  BY G.E. HOSKINS,  B.E. MCLEAN AND C.J. WEST ###
92  REM
100 D$ =  CHR$ (4):TA$ =  CHR$ (7)
110  DIM DL$(24),TL$(29),DS$(24,4),SD$(28),AI(14)
120  FOR I = 1 TO 6: READ ML$(I): NEXT
130  DATA INTRODUCTORY NOTES, ANESTHETICS, CHEMICAL NOTES, DISINFECTANTS,
      CASE REPORTER, DISEASE TREATMENT
140  HOME : VTAB 11: HTAB 13: PRINT "W O R K I N G": GOSUB 9900
150  HOME : FOR I = 20 TO 1 STEP  - 1: FOR J = 1 TO 22 STEP 21: VTAB J: HTAB
     I: PRINT "*": VTAB J: HTAB 41 - I: PRINT "*": NEXT : NEXT : FOR I =
     2 TO 21: VTAB I: HTAB 1: PRINT "*": VTAB I: HTAB 40: PRINT "*": NEXT

160  VTAB 1: PRINT "*************   FISH HEALTH  *************": VTAB 3: HTAB
     12: PRINT "( VERSION 19/10/82 )": FOR I = 1 TO 6: VTAB 2 * I + 6: HTAB
     8: PRINT I;"   ";ML$(I): NEXT :V = 5:U = 6:X$ = "ITEM": GOSUB 9100:M
     F = F
170  FOR I = 6 TO MF * 2 + 6:X =  PEEK ( - 16336):X =  PEEK ( - 16336): VTAB
     I - 1: HTAB 10: PRINT " ": HTAB 10: PRINT ">": FOR X = 1 TO 20: NEXT
     X: NEXT : GOSUB 9000: IF RS$ = "N" THEN 160
190  ON MF GOTO 5200,5500,6000,10000,5600,1000
997  REM
998  REM & TREATMENT CALCULATIONS
999  REM   && SELECT DIAGNOSIS
1000  HOME : VTAB 4: FOR I = 1 TO 18: PRINT  SPC( 2 -  LEN ( STR$ (I))); I
     ;" ";DL$(I): NEXT
1010  FOR I = 4 TO 9: VTAB I: HTAB 24: PRINT I + 15;" ";DL$(I + 15): NEXT

1020 V = 1:U = 24:X$ = "DIAGNOSIS": GOSUB 9100:DF = F: GOSUB 900C: IF RS$
      = "N" THEN 1020
1028  REM
1029  REM  && SELECT STAGE, P/C
1030  HOME : FOR I = 1 TO 4: VTAB I + 3: PRINT " ";I;"  ";SL$(I): NEXT : VTAB
     17: PRINT " 1  PREVENTION": PRINT " 2  CONTROL"
1040 V = 1:U = 4:X$ = "STAGE": GOSUB 9100:SF = F
1050 V = 14:U = 2:X$ = "PREVENT/CONTROL": GOSUB 9100:PF = F: GOSUB 9000: IF
     RS$ = "N" THEN 1040
1098  REM
1099  REM  # PRESENT TREAT/APP'S
1100 L =  LEN (DS$(DF,SF)) / 4: IF L > 0 THEN 1120
1110  PRINT TA$: PRINT TA$: HOME : SPEED= 150: PRINT "SORRY, NO TREATMENT
     S ON RECORD": VTAB 20: PRINT "PRESS ANY KEY TO RETURN TO MENU": SPEED=
     255: GET RS$: RUN
1120 T =  - 999999:D = 0: FOR I = 1 TO L:X$ =  MID$ (DS$(DF,SF),I * 4 - 3
     ,4):PC =  VAL ( MID$ (X$,4,1)): IF PC <  > PF AND PC <  > 3 THEN 118
     0
1130  IF  LEFT$ (X$,2) <  > "25" THEN  IF  LEFT$ (X$,2) <  > "13" THEN 11
     70
1140  IF T =  - 999999 THEN  PRINT TA$: HOME : PRINT  SPC( 18);"NOTE!": VTAB
     10: PRINT  SPC( 9);"WHAT IS THE TEMP ('C)"
1150  IF T =  - 999999 THEN  VTAB 10: HTAB 32: INPUT "";T: GOSUB 9000: IF
     RS$ = "N" THEN T =  - 999999: GOTO 1150
```

```
1160  IF T >  = 18 THEN 1180
1170 D = D + 1:DT$(D) = X$
1180  NEXT : IF D = 0 OR (D = 1 AND  LEFT$ (DT$(D),2) = "10") THEN 1110
1200  HOME : PRINT "SELECTED : DIAGNOSIS : ";DL$(DF): PRINT "========   P
     URPOSE : ";PL$(SF): PRINT "            STAGE : ";SL$(PF): VTAB 9: FOR
     I = 1 TO D:T =  VAL ( MID$ (DT$(I),1,2)):A =  VAL ( MID$ (DT$(I),3,1
     )): PRINT I;"  ";TL$(T);"  /  ";AL$(A): PRINT : NEXT
1210 V = 6:U = D:X$ = "TREATMENT / APPLICATION": GOSUB 9100:T = F: GOSUB
     9000: IF RS$ = "N" THEN 1210
1220 TF =  VAL ( MID$ (DT$(T),1,2)):AF =  VAL ( MID$ (DT$(T),3,1)): HOME
     : PRINT TL$(TF): VTAB 6: GOSUB 9300: GOSUB 9200
1228  REM
1229  REM  ## PRESENT NOTES ##
1230  HOME : PRINT TL$(TF): PRINT :NT = 2: IF TF <  = 24 THEN NT = 1: ON
     TF - 10 GOSUB 9310,9320,9330,9340,9350,9360,9370,9380,9390,9400,9410
     ,9410,9430,9440
1231  IF TF = 25 THEN  HOME : PRINT TL$(13): PRINT : GOSUB 9330: GOSUB 92
     00: HOME : PRINT TL$(17): PRINT : GOSUB 9370
1232  IF TF = 26 THEN  HOME : PRINT TL$(23): PRINT : GOSUB 9430: GOSUB 92
     00: HOME : PRINT TL$(21): PRINT : GOSUB 9410
1233  IF TF = 27 THEN  HOME : PRINT TL$(23): PRINT : GOSUB 9430: GOSUB 92
     00: HOME : PRINT TL$(22): PRINT : GOSUB 9410
1234  IF TF = 28 THEN  HOME : PRINT TL$(15): PRINT : GOSUB 9350: GOSUB 92
     00: HOME : PRINT TL$(21): PRINT : GOSUB 9410
1235  IF TF = 29 THEN  HOME : PRINT TL$(15): PRINT : GOSUB 9350: GOSUB 92
     00: HOME : PRINT TL$(22): PRINT : GOSUB 9410
1240  VTAB 23: HTAB 12: PRINT "(N=SELECT ANOTHER TREATMENT)": GOSUB 9000:
      IF RS$ = "N" THEN 1200
1250  HOME : PRINT "SELECTED APPLICATION ** ";AL$(AF);" **": VTAB 5: GOSUB
     9450
1280  VTAB 23: HTAB 12: PRINT "( N = ANOTHER APPLICATION )": GOSUB 9000: IF
     RS$ = "N" THEN 1200
1288  REM
1289  REM  ## PRESENT STANDARD DOSE ##
1290  HOME : PRINT "SELECTED : ";SL$(SF): PRINT "========   ";TL$(TF): PRINT
      SPC( 11);AL$(AF): PRINT  SPC( 11);DL$(DF);" ";PL$(PF)
1300 SD = 0: FOR I = 1 TO 28: IF  LEFT$ (SD$(I),3) =  STR$ (TF) +  STR$ (
     AF) THEN SD = I:I = 28
1310  NEXT :DO = 2: IF TF <  > 24 AND SD = 0 AND AF <  > 8 THEN  VTAB 11:
      PRINT "NO STANDARD DOSAGE ON RECORD.": PRINT : PRINT "YOU WILL HAVE
      TO ENTER THE REQUIRED      ": PRINT "CONCENTRATIONS.": GOSUB 9200: GOTO
     1350
1320  IF TF = 24 OR AF = 8 THEN  VTAB 11: PRINT "SEE MANUFACTURER'S INSTR
     UCTIONS": VTAB 20: PRINT "PRESS ANY KEY TO RESTART PROGRAM": VTAB 20
     : HTAB 38: GET RS$: RUN
1330  VTAB 7: GOSUB 9500: GOSUB 1700: GOSUB 9000: IF RS$ = "N" THEN 1290
1340  ON AF GOTO 1400,2000,1400,2000,2500,2200,2400,1320
1350 LD =  VAL ( MID$ ("2332121",AF,1)): FOR X = 1 TO LD:N$(X) = "":L$(X)
      =  MID$ ("PPMDAY   PPMMINDAYPPMHRSDAYPPMMIN   PPM      GMSDAY   MGS
          ",AF * 9 - 8 + (X - 1) * 3,3): NEXT : IF L$(LD) = "DAY" THEN L
     $(LD) = "DAYS"
1357  IF TF > 24 THEN  PRINT  CHR$ (7): PRINT "PROGRAM CAN'T CONTINUE": PRINT
     : PRINT "COMPLAIN TO CAM WEST": END
```

```
1360 DO = 1:NT = 1:T(1) = TF: VTAB 8: HTAB 1: CALL  - 958: PRINT "ENTER D
     OSAGE (ACTIVE INGREDIENT)": PRINT "============": PRINT : FOR X = 1 TO
     LD: PRINT  SPC( 9 -  LEN (L$(X)));L$(X);" = ": NEXT : FOR X = 1 TO L
     D
1370  VTAB 10 + X: HTAB 14: INPUT "";RS$:N$(X) = RS$: IF  VAL (RS$) = 0 THEN
     1370
1380  NEXT : GOSUB 9000: IF RS$ = "N" THEN 1360
1390  GOSUB 1740: GOSUB 9000: ON RS GOTO 1360,1340
1398  REM
1399  REM     ## CALC : 1 HR BATH & LONG BATH ##
1400  HOME :HR = 1: PRINT "** ";TL$(TF);" ";AL$(AF);" **": VTAB 6: PRINT
     "  1  STOCK SOLUTION CONC.": PRINT : PRINT "  2  PUMP METERING SPEED
     ": PRINT : PRINT "  3  POND INFLOW": PRINT : PRINT "  4  POND CONCEN
     TRATION"
1410 V = 4:U = 4:X$ = "ITEM TO BE CALCULATED": GOSUB 9100:CF = F
1420  IF TF = 25 THEN  GOSUB 1560: GOTO 1440
1430 V = 15: IF CF <  > 1 THEN  VTAB V: INPUT "  ENTER STOCK CONC. (PPM)
         ";CS$:CS =  VAL (CS$):V = V + 2: IF CS = 0 THEN V = V - 2: GOTO
     1430
1440  IF CF <  > 2 THEN  VTAB V: INPUT "  ENTER PUMP SPEED  (ML/MIN)    ";
     PS$:PS =  VAL (PS$):V = V + 2: IF PS = 0 THEN V = V - 2: GOTO 1440
1450  IF CF <  > 3 THEN  VTAB V: INPUT "  ENTER POND FLOW   (LPM)       ";
     Q$:Q =  VAL (Q$):V = V + 2: IF Q = 0 THEN  INPUT "  ENTER POND FLOW
       (CFS)       ";Q$:Q =  VAL (Q$) * 28.317 * 60:V = V + 1: IF Q = 0 THEN
     V = V - 3: VTAB V + 1: CALL  - 868: GOTO 1450
1460  IF TF = 25 THEN  GOSUB 1580: GOTO 1500
1470  IF CF <  > 4 THEN  VTAB V: PRINT  SPC( 31); VAL (N$(1)): VTAB V: INPUT
     "  ENTER POND CONC.  (PPM)       ";CP$:CP =  VAL (CP$): IF CP = 0 THEN
     CP =  VAL (N$(1)): VTAB V: HTAB 32: PRINT CP
1500  IF CF = 1 THEN CS = CP * (Q * 1000 + PS) / PS: IF TF = 25 THEN C2S =
     C3P * (Q * 1000 + PS) / PS
1510  IF CF = 2 THEN PS = (Q * 1000 + PS) * CP / CS
1520  IF CF = 3 THEN Q = (CS * PS / CP - PS) / 10
1530  IF CF = 4 THEN CP = CS * PS / (Q * 1000 + PS): IF TF = 25 THEN C3P =
     C2S * PS / (Q * 1000 + PS)
1540 LH = PS * 6 / 100:GM = 48 * CS * .00208333 / AI(3) / 100:G2M = 48 *
     C2S * .00208333 / AI(7) / 100: IF AF = 3 THEN HR =  VAL (N$(2)): IF
     TF > 24 THEN HR =  VAL (N$(3))
1546  GOSUB 9000: IF RS$ = "N" THEN 1400
1548  REM
1549  REM   ## TABLE RESULTS ##
1550  GOTO 4000
1560 V = 15: IF CF <  > 1 THEN  VTAB V: INPUT "  ENTER FORM.STOCK CONC. (
     PPM) ";RS$:CS =  VAL (RS$): INPUT "  ENTER MAL. STOCK CONC. (PPM) ";
     RS$:C2S =  VAL (RS$):V = V + 3: IF CS = 0 OR C2S = 0 THEN V = V - 3:
      GOTO 1560
1570  RETURN
1580  IF CF <  > 4 THEN H = 32: VTAB V: PRINT "  ENTER POND FORM. CONC. (
     PPM) "; VAL (N$(1)): PRINT "  ENTER POND MAL.  CONC. (PPM) "; VAL (N
     $(2)): VTAB V: HTAB H: INPUT "";RS$:CP =  VAL (RS$): IF CP = 0 THEN
     CP =  VAL (N$(1)): VTAB V: HTAB H: PRINT CP
1590  IF CF <  > 4 THEN V = V + 1: VTAB V: INPUT "  ENTER POND MAL.  CONC
     . (PPM) ";RS$:C3P =  VAL (RS$): IF C3P = 0 THEN C3P =  VAL (N$(2)): VTAB
     V: HTAB H: PRINT C3P
1600  RETURN
```

```
1698  REM
1699  REM  ##### CHECK DOSE AND A.I. ##
1700  VTAB 18: PRINT "   STANDARD DOSE OK ?":V = 18:H = 21: GOSUB 9010:DO
      = 2: IF RS$ = "Y" THEN DO = 1: GOTO 1730
1710  VTAB 17: CALL  - 958: POKE 33,7: FOR I = 1 TO LD:V = 9 + I: VTAB V:
      POKE 34,V - 1: POKE 35,V + 1: INPUT "";RS$: IF RS$ = "" THEN RS$ =
     N$(I): VTAB V: PRINT RS$
1720 N$(I) = RS$: POKE 35,20: NEXT : POKE 33,40: POKE 34,0: POKE 35,24: VTAB
      20: PRINT "DOSES OK (Y/N) ?":V = 20:H = 16: GOSUB 9010: IF RS$ = "N"
      THEN 1710
1730  IF AF = 7 THEN 1790
1740  FOR I = 1 TO NT:A(I) = AI(T(I) - 10): NEXT
1750  VTAB 15: HTAB 1: CALL  - 958: PRINT "A.I. OF CHEMICALS :": PRINT "=
     ================": PRINT : FOR I = 1 TO NT: PRINT  SPC( 7 -  LEN ( STR$
     (A(I) * 100)));A(I) * 100;" % ";TL$(T(I))
1752 X$ =  LEFT$ (TL$(T(I)),3): IF X$ = "BRI" OR X$ = "OVA" OR X$ = "WES"
      OR X$ = "BET" THEN  VTAB  PEEK (37): HTAB 22: PRINT "(IODINE)"
1755  NEXT : VTAB 21: PRINT "A.I.'S  OK ?":V = 21:H = 12: GOSUB 9010: IF
     RS$ = "Y" THEN 1780
1760  POKE 33,7: FOR I = 1 TO NT:V = 17 + I: VTAB V: POKE 34,V - 1: POKE
     35,V + 1: INPUT "";RS$: IF RS$ = "" THEN RS$ =  STR$ (A(I) * 100): VTAB
     V: PRINT RS$
1770 A(I) =  VAL (RS$) / 100: POKE 35,20: NEXT : POKE 33,40: POKE 34,0: POKE
     35,24:V = 21: VTAB V: PRINT "A.I.'S OK (Y/N) ?":H = 17: GOSUB 9010: VTAB
     21: CALL  - 868: IF RS$ = "N" THEN 1750
1780  RETURN
1790  VTAB 14: HTAB 1: CALL  - 958: PRINT "INJECTION SOLUTION": PRINT "==
     ================": PRINT : INPUT "     MG A.I. / ML = ";RS$
1800 A(1) =  VAL (RS$):X =  VAL (N$(1)) /  VAL (RS$): IF 0 > X OR X >  =
     .25 THEN  PRINT : PRINT "!!!! INJECTION VOLUME TOO GREAT !!!!": GOSUB
     9200: GOTO 1790
1810  RETURN
1998  REM
1999  REM  ## DIP & STATIC BATH ROUTINE ##
2000  HOME :DC =  VAL (N$(1)):AI = A(1): PRINT "ARE VOLUME CALCULATIONS N
     EEDED ?": PRINT : PRINT " ( Y = CALCULATIONS ),  (Y/N) ":V =  PEEK (
     37):H = 32: GOSUB 9010: IF RS$ = "Y" THEN 2070
2010  FOR I = 1 TO 5: VTAB 10 + I: PRINT " ";I;"  ";UL$(I): NEXT :V = 9:U
      = 5:X$ = "UNIT": GOSUB 9100:UF = F
2020  VTAB 18: PRINT "ENTER VOLUME IN ";UL$(UF): VTAB 18: HTAB 26: INPUT
     "";V$:VI =  VAL (V$):VL = VI * UC(UF): IF VI = 0 THEN 2020
2030  GOSUB 9000: IF RS$ = "N" THEN 2000
2040  GOTO 2150
2070  HOME : FOR I = 1 TO 4: VTAB I + 2: PRINT " ";I;"  ";CL$(I): NEXT : FOR
     I = 1 TO 5: VTAB 11 + I: PRINT " ";I;"  ";UL$(I + 5): NEXT :V = 1:U =
     4:X$ = "CONTAINER": GOSUB 9100:CF = F:V = 10:U = 5:X$ = "UNIT": GOSUB
     9100:UF = F + 5
2080  FOR I = 1 TO 7: VTAB I + 9: CALL  - 868: NEXT : VTAB 10: PRINT "ENT
     ER ";CL$(CF);" DIMENSIONS": PRINT : PRINT " IN ";UL$(UF)
2090  VTAB 15: INPUT "-DEPTH        ";DD$:D =  VAL (DD$): IF CF = 2 THEN
      INPUT "-DIAMETER     ";R$:R =  VAL (R$) / 2:VI = D * 3.14159265 * R
     © 2: GOTO 2130
```

```
2100  IF CF = 4 THEN  INPUT "-TOP WIDTH    ";TW$:TW =  VAL (TW$): INPUT "
    -BOTTOM WIDTH ";BW$:BW =  VAL (BW$):W = (TW + BW) / 2: GOTO 2120
2110  INPUT "-WIDTH        ";W$:W =  VAL (W$)
2120  INPUT "-LENGTH       ";L$:L =  VAL (L$):VI = D * W * L: IF CF = 3 THEN
    VI = (L - W) * W + 3.14159265 * (W / 2) ^ 2
2130  IF VI = 0 THEN 2090
2140 VL = VI * UC(UP) ^ 3 / 1000: VTAB 20: PRINT "VOLUME (CU. ";UL$(UF);"
    ) = "; INT (VI * 1000 + .5) / 1000: PRINT  SPC( 7);"   ( LITERS ) =
    "; INT (VL * 1000 + .5) / 1000: GOSUB 9000: IF RS$ = "N" THEN 2000
2150  GOTO 4000
2198  REM  ## ORAL TREATMENT ##
2199  REM
2200  HOME : PRINT "INPUT TOTAL FISH WEIGHT IN POND"
2210  VTAB 7: PRINT " 1   TOTAL WEIGHT (LB) =": PRINT : PRINT : PRINT " 2
      TOTAL WEIGHT (KG) =": PRINT : PRINT : PRINT " 3   NO. OF FISH =":
     PRINT "       FISH / LB =": PRINT : PRINT " 4   NO. OF FISH =": PRINT
    "       GM / FISH ="
2220 V = 4:U = 4:X$ = "METHOD": GOSUB 9100:WF = F: ON WF GOTO 2230,2240,2
    250,2260
2230  VTAB 7: HTAB 27: INPUT "";RS$:W =  VAL (RS$): GOTO 2270
2240  VTAB 10: HTAB 27: INPUT "";RS$:W =  VAL (RS$) * 2.20463414: GOTO 22
    70
2250  VTAB 13: HTAB 20: INPUT "";RS$:N =  VAL (RS$): HTAB 20: INPUT "";RS
    $:W = N /  VAL (RS$): GOTO 2270
2260  VTAB 16: HTAB 20: INPUT "";RS$:N =  VAL (RS$): HTAB 20: INPUT "";RS
    $:W = N *  VAL (RS$) / 454: GOTO 2270
2270  VTAB 20: PRINT "****  TOTAL WEIGHT OF FISH IN POND  ****": PRINT  SPC(
    11);"        = "; INT (W);" LB"
2280  GOSUB 9000: IF RS$ = "N" THEN 2200
2310  GOTO 4000
2398  REM
2399  REM  ## INJECTION ##
2400  GOTO 4000
2498  REM
2499  REM  ##  FLUSH ##
2500  HOME : PRINT "INPUT FLOW": PRINT : PRINT : PRINT : PRINT : PRINT "1
      GPM(IMP) =": PRINT : PRINT "2   GPM(US)  =": PRINT : PRINT "3   C
    FS      =": PRINT : PRINT "4   LPM      ="
2510 V = 4:U = 4:X$ = "METHOD": GOSUB 9100: VTAB 2 * F + 4: HTAB 16: INPUT
    "";RS$:UC(3) = UC(3) * 60:UC(4) = 1:LPM =  VAL (RS$) * UC(F): IF  VAL
    (RS$) = 0 THEN 2510
2520  VTAB 15: PRINT "FLOW = ";LPM;" LPM": VTAB 18:D =  VAL (N$(1)): PRINT
    TL$(TF) + " DOSE = ";D;" PPM/MIN"
2540  VTAB 20: PRINT "DO YOU HAVE A STOCK": PRINT TL$(TF);" SOLUTION (Y/N
    ) ?":V = 21:H =  LEN (TL$(TF)) + 17: GOSUB 9010:CS = .01: IF TF = 13
     THEN CS = .10
2550  VTAB 20: HTAB 1: CALL  - 868: VTAB 21: CALL  - 868: VTAB 20: PRINT
    "STOCK ";TL$(TF);" SOLUTION = ": IF RS$ = "N" THEN  VTAB 20: HTAB H +
    2: PRINT CS * 100;" % A.I.": GOTO 2570
2560  VTAB 20: HTAB H + 8: PRINT "% A.I.": VTAB 20: HTAB H + 3: INPUT "";
    RS$:CS =  VAL (RS$) / 100: VTAB 20: HTAB H + 8: PRINT "% A.I.": IF C
    S = 0 THEN 2560
2570  GOSUB 9000: IF RS$ = "N" THEN 2500
```

```
2578  REM
2579  REM  ##  OUTPUT  ##
2580  GOTO 4000
3998  REM
3999  REM  ## OUTPUT TABLE ##
4000  HOME :HC = 0:U$ = " GM ":U2$ = U$: IF TF = 11 OR TF = 13 OR TF = 18
      OR TF = 20 OR TF = 25 OR MF = 2 AND LF = 1 THEN U$ = " ML "
4010  IF HC = 1 THEN  PRINT " ": PRINT TITLE$: PRINT
4020  PRINT DL$(DF);" ";PL$(PF): PRINT SL$(SF): PRINT " ":RS$ = "  " + TL
      $(TF) + "  " + AL$(AF) + "  ": FOR X = 1 TO  INT ((39 -  LEN (RS$)) /
      2):RS$ = "*" + RS$ + "*": NEXT : PRINT RS$: PRINT : ON AF GOSUB 4100
      ,4200,4100,4200,4400,4300,4350,4600
4030  PR# 0: VTAB 23: FOR X = 1 TO 1000: NEXT : POKE  - 16368,0: PRINT "H
      ARDCOPY (Y/N)      (N = RETURN TO MENU)":V = 23:H = 16: GOSUB 9010: IF
      RS$ = "N" THEN  RUN
4040  IF HC = 0 THEN HC = 1: PRINT : PRINT "ENTER TITLE ( DO NOT USE ANY
      COMMAS )": INPUT TITLE$
4050  PR# 1: PRINT " ": GOTO 4010
4098  REM
4099  REM  ## TABLE : 1 HR BATH, LONG BATH ##
4100  PRINT "  POND FLOW   (LPM)          = "; INT (Q): PRINT : PRINT "
      PUMP SPEED  (ML/MIN)       = "; INT (PS): PRINT : IF TF = 25 THEN 41
      30
4110  PRINT "  STOCK CONC. (PPM A.I.)     = "; INT (CS * 10 + .5) / 10: PRINT
      : PRINT "  POND CONC.  (PPM A.I.)     = "; INT (CP * 10 + .5) / 10: GOSUB
      4170
4120  PRINT "************ STOCK RECIPE ***************": PRINT "  "; INT (
      GM * LH * HR / A(1) * 10 + .5) / 10;U$;TL$(TF);" (";A(1) * 100;" % A
      .I.)": PRINT : PRINT "  MADE UP TO "; INT (LH * HR * 10 + .5) / 10;"
       LITRES WITH WATER": RETURN
4130  PRINT "  STOCK (PPM A.I.)  FORMALIN = "; INT (CS * 100 + .5) / 100:
       PRINT  SPC( 19);"MALACHITE = "; INT (C2S * 100 + .5) / 100: PRINT :
       PRINT "  POND (PPM A.I.)   FORMALIN = "; INT (CP * 100 + .5) / 100:
       PRINT  SPC( 19);"MALACHITE = "; INT (C3P * 100 + .5) / 100: GOSUB 4
      170
4140  PRINT "************ STOCK RECIPE ***************"
4150  PRINT "  "; INT (GM * LH * HR / A(1));" ML FORMALIN  (";A(1) * 100;
      " % A.I.)": PRINT "  "; INT (G2M * LH * HR / A(2) * 100 + .5) / 100;
      " GM MALACHITE  ("A(2) * 100;" % A.I.)": PRINT "  MADE UP TO "; INT
      (LH * HR);" LITRES WITH WATER": RETURN
4170  PRINT : IF AF = 3 THEN  PRINT "  "; INT (LH * HR * 100 + .5) / 100;
      " LITERS OF STOCK SOL. OVER ";HR;" HR": PRINT
4180  RETURN
4198  REM
4199  REM  ## DIP, STATIC BATH TABLE ##
4200 GL =  INT (DC / AI * 10000 + .5) / 10000000:GT =  INT (DC * VL / AI +
      .5) / 1000: PRINT : PRINT "  TREATMENT CONC. = ";DC;" PPM A.I.": PRINT
      : IF GT >  = 1000 THEN GT =  INT (GT)
4210  IF MF = 6 THEN  PRINT "  APPLY FOR ";N$(2);" MIN.": PRINT
4220 VI =  INT (VI * 1000 + .5) / 1000:VL =  INT (VL * 1000 + .5) / 1000:
       IF MF = 2 AND LF = 1 THEN TL$(TF) = TL$(TF) + " STOCK"
4230 U2L$ = "": IF UF > 5 THEN U2L$ = "CU": IF VL >  = 1000 THEN VL =  INT
      (VL)
```

```
4240  IF VL >  = 1000 THEN VL =  INT (VL)
4250  PRINT : PRINT "**********   BATH PREPARATION   **********": PRINT : PRINT
      SPC( 6 -  LEN ( LEFT$ ( STR$ (GT),6)));GT;U$;" ";TL$(TF);" (";AI *
      100;" % A.I.)": PRINT : PRINT " IN "; INT (VI * 1000 + .5) / 1000;"
      ";U2L$;" ";UL$(UF);"  (";  INT (VL * 10 + .5) / 10;" LITERS)"
4260  IF MF = 2 THEN  PRINT : PRINT : PRINT "THIS IS  GUIDELINE AND VARIE
      S WITH TEMP ": PRINT "TRY A TEST GROUP IF NOT FAMILIAR !!!!!"
4270  RETURN
4297  REM
4298  REM  ##  ORAL TABLE  ##
4299  REM
4300  FOR I = 1 TO NT: PRINT "  "; VAL (N$(I));" "L$(I);" ";TL$(T(I));" A
      .I./100 LB/DAY": PRINT : NEXT : PRINT "  "; VAL (N$(1 + NT));" ";L$(
      1 + NT): PRINT : PRINT "  "; INT (W);" LB OF FISH": PRINT
4310  PRINT "**************  RECIPE  **************": PRINT : FOR I = 1 TO
      NT: PRINT "  "; INT ( VAL (N$(I)) * W / A(I) + .5) / 100;" ";L$(I);"
       ";TL$(T(I));" / DAY": PRINT  SPC( 13);"(";A(I) * 100;" % A.I.)": PRINT
      : NEXT : RETURN
4347  REM
4348  REM  ##  INJECTION  ##
4349  REM
4350  PRINT :X =  INT ( VAL (N$(1)) * 100 / A(1) + .5) / 100: PRINT  SPC(
      6 -  LEN ( STR$ (X)));X;" ML ";TL$(TF);" SOLUTION": PRINT : PRINT  SPC(
      10);"/ LB OF FISH": PRINT : PRINT : PRINT "*************   RECIPE
      ************": PRINT
4360  PRINT "     SOLUTION = ";A(1);" MG A.I./ ML": RETURN
4397  REM
4398  REM  ## FLUSH TABLE ##
4399  REM
4400  PRINT "  ";D;" PPM TREATMENT :": PRINT : PRINT "  "; INT (.25 * LPM
       / CS + .5) / 10;" ML ";TL$(TF);" STOCK SOL.": PRINT "        (";CS *
      100;" %  A.I. STOCK SOL.)": PRINT : PRINT "  INTO ";LPM;" LPM FLOW":
       PRINT
4410  PRINT "********  ";CS * 100;" %  STOCK RECIPE  *******": PRINT :UL$
      = " ML": IF TF <  > 13 THEN UL$ = " GM "
4420  PRINT "  "; INT (CS * 10000 / A(1) + .5) / 10;UL$;TL$(TF);" (";A(1)
       * 100;" % A.I.)/ LITER": PRINT : IF TF = 13 THEN  PRINT "  NOTE.: 1
      00 % FORMALIN": PRINT  SPC( 11);"= 37 % FORMALDEHYDE": PRINT
4430  IF TF = 17 THEN  PRINT : PRINT "FLUSH NOT RECOMMENDED AFTER EYED ST
      AGE  ": PRINT "2 PPM METERED FOR 1 HR IS PREFERRED": PRINT : PRINT "
      ****************************************"
4440  RETURN
4998  REM
4999  REM  ###  EQUIPMENT DISINFECTION  ###
5000  HOME :LS = 0: PRINT "**** ";ML$(MF);" ****": VTAB 5: FOR I = 1 TO 7
      : PRINT "  ";I;"   ";TL$(I + 10): PRINT : NEXT :U = 7:V = 3:X$ = "DI
      SINFECTANT": GOSUB 9100:TF = F + 10:A(1) = AI(TF - 10): VTAB F * 2 +
      3: HTAB 5: PRINT ">": IF F = 7 THEN LS = 1
5010  IF TF > 15 THEN  VTAB 21: PRINT "   1  EQUIP. DISINFECTION": PRINT
      "   2  POND   DISINFECTION":V = 19:U = 2:X$ = "CHLORINE USE": GOSUB
      9100:CLF = F: GOSUB 9000: IF RS$ = "N" THEN 5000
5020  IF TF > 15 THEN  GOSUB 8830: GOSUB 9200: HOME : ON CLF GOSUB 8860,8
      870: GOSUB 9000: IF RS$ = "N" THEN 5000
```

```
5030  IF TF = 11 THEN  VTAB 21: PRINT "  1  ROCCAL  10 %  A.I.": PRINT "
      2  ROCCAL  20 %  A.I.":V = 19:U = 2:X$ = "ROCCAL CONCENTRATION": GOSUB
     9100:AI(TF - 10) = AI(TF - 10) * F: GOSUB 9000: IF RS$ = "N" THEN 50
     00
5040  IF TF = 12 THEN  VTAB 21: PRINT "  1  HYAMINE 1622  SOLID  (100 % A
     .I.)": PRINT "  2  HYAMINE 1622  LIQUID  (50 % A.I.)":V = 19:U = 2:X
     $ = "HYAMINE TYPE": GOSUB 9100:AI(TF - 10) = AI(TF - 10) / F:LS = 2 -
     F: GOSUB 9000: IF RS$ = "N" THEN 5000
5050  IF TF > 12 AND TF < 16 THEN  GOSUB 9000: IF RS$ = "N" THEN 5000
5060  HOME : PRINT TL$(TF): PRINT : PRINT ML$(MF): VTAB 7:AF = 2:NT = 1:S
     D = TF - 10: IF TF > 15 THEN SD$(TF - 10) = "0" +  STR$ (TF - 10) +
     "5" +  MID$ (SD$(5 + CLF),4,3)
5070  GOSUB 9500: GOSUB 1700:AL$(AF) = "DISINFECTANT BATH"::DF = 1:DL$(DF
     ) = "":PF = 1:PL$(PF) = "":SF = 1:SL$(SF) = ""
5080 TL$(13) = TL$(TF):TL$(14) = TL$(TF):TF = 13 + LS: HOME : GOSUB 2000:
      RUN
5198  REM
5199  REM  ## DOCUMENTATION ##
5200  HOME : VTAB 3: PRINT "  THIS PROGRAM HAS BEEN PREPARED FOR": PRINT
     : PRINT "USE IN THE FEDERAL FACILITIES OF THE": PRINT : PRINT "SALMO
     NID ENHANCEMENT PROGRAM IN": PRINT : PRINT "BRITISH COLUMBIA."
5210  VTAB 15: PRINT "  CARE SHOULD BE TAKEN WHEN USING": PRINT : PRINT "
     THIS PROGRAM AT ANY OTHER LOCATION.": GOSUB 9200
5220  HOME : VTAB 3: PRINT "  FOR INFORMATION, CONTACT:": VTAB 6: PRINT "
      -  GARY HOSKINS": PRINT "     DIAGNOSTIC SERVICE": PRINT "     DEP
     T. OF FISHERIES & OCEANS":: PRINT "     PACIFIC BIOLOGICAL STATION":
      PRINT "     NANAIMO,BC"
5230  VTAB 13: PRINT "  -  CAM WEST  OR  BILL MCLEAN": PRINT "     SALMON
     ID ENHANCEMENT PROGRAM": PRINT "     DEPT. OF FISHERIES & OCEANS": PRINT
     "     1090 WEST PENDER ST": PRINT "     VANCOUVER,BC"
5240  GOSUB 9200
5250  HOME : PRINT "NOTE !!!": PRINT : PRINT "THE CHEMICALS REFERRED TO A
     RE COMMONLY  USED IN FEDERAL B.C. FACILITIES.": PRINT
5260  PRINT "  THE SELECTION OF DISEASES IN THIS     PROGRAM ARE FOUND IN
      B.C. WATERS.  THE  TREATMENTS GIVEN ARE RECOMMENDED BY THE DISEASE
     DIAGNOSTICS LAB, DFO."
5270  PRINT : PRINT "  TREATMENT/APPLICATIONS ARE LISTED IN  ORDER OF PRE
     FERENCE.  THEREFORE, THOSE  AT THE TOP OF THE LIST ARE THE MOST
     HIGHLY RECOMMENDED.": PRINT
5280  PRINT "  OPERATION OF THE DISEASE PROGRAM IS   SIMPLE.  ILLEGAL ENT
     RIES ARE NOT RECOG- NIZED.  ANY ENTRY CAN BE CHANGED BY     PRESSING
      <N> WHEN ASKED 'OK (Y/N)'.     THIS REPEATS THE MOST RECENT SCREEN
     OF  QUESTIONS."
5290  GOSUB 9000: IF RS$ = "N" THEN 5250
5300  HOME : PRINT "  OPTIONS HAVE BEEN GIVEN FOR ALL       FORESEEN INST
     ANCES IN WHICH THE USER MAYREFER TO DIFFERENT PONDS AND/OR USE ONE O
     F MANY POSSIBLE UNITS OF MEASURE."
5310  PRINT : PRINT "  WHEN ENTERING THE POND FLOW FOR       LONG BATH OR
      1 HOUR BATH CALCULATIONS,  PRESSING THE RETURN KEY WILL ALTERNATE
     THE UNITS BETWEEN LPM AND CFS.": PRINT
5320  PRINT "  BY PRESSING  'CTRL R'  YOU MAY RETURN DIRECTLY TO THE MAIN
      MENU FROM ANY PART OF THE PROGRAM.  'CTRL P'  WILL  COPY  VIDEO DI
     SPLAYS ONTO THE PRINTER.  CTRL  COMMANDS MAY BE USED WHEN THESE REQU
     ESTSAPPEAR :": PRINT
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```
5330  PRINT "    1)  OK (Y/N) ?": PRINT "    2)  SELECT # ?": PRINT "
     3)  (PRESS ANY KEY TO CONTINUE) ? ": GOSUB 9200
5350  HOME : PRINT "NOTE : A.I. IS USED AS THE SHORT FORM OF       ACTIVE
      INGREDIENT.": VTAB 13: HTAB 4: PRINT "( ANY SUGGESTIONS TO IMPROVE
     THE          DISEASE PROGRAM ARE WELCOME.  )"
5360  VTAB 23: HTAB 1: PRINT "PRESS ANY KEY TO RETURN TO THE MENU": VTAB
     23: HTAB 39: GET RS$: RUN
5498  REM
5499  REM   ## ANESTHETIC ##
5500 LF = 0:TL$(11) = "MS222":TL$(12) = TL$(11):TL$(13) = "2-PHENOXYETHAN
     OL":TL$(14) = "CO2":N$(1) = " 75":N$(2) = "400":N$(3) = "200":A(1) =
     1
5510  HOME : PRINT "ANESTHETIC": PRINT "**********": VTAB 8: PRINT " 1  M
     S222 -  75 MG / L FOR GENERAL USE": PRINT : PRINT " 2  MS222 - 400 M
     G / L TO KILL FISH": PRINT : PRINT " 3  2-PHENOXYETHANOL - 0.2  ML /
      LITRE": PRINT  SPC( 23);"FOR GENERAL USE"
5520  PRINT : PRINT " 4  CO2   -  200 TO 400 MG/L":AL$(2) = "ANESTHETIC B
     ATH":AF = 2:DF = 1:DL$(1)h"":PF = 1:PL$(1) = "":SF = 1:SL$(1) = "":U
      = 4:V = 5:X$ = "ANESTHETIC": GOSUB 9100:N$(1) = N$(F):TF = F + 10: IF
     F = 3 THEN LF = 1
5530  IF TF < 14 THEN V = 18: VTAB V: PRINT "ARE YOU USING A STOCK SOLUTI
     ON ?":H = 32: GOSUB 9010: IF RS$ = "N" THEN 5550
5540 LF = 1: VTAB 20: HTAB 1: INPUT "STOCK CONCENTRATION (A.I. %) = ";RS$
     :A(1) =  VAL (RS$) / 100: IF A(1) = 0 THEN 5540
5550  HOME : PRINT TL$(TF);" :": PRINT : ON TF - 10 GOSUB 8900,8900,8910,
     8920: VTAB 23: HTAB 13: PRINT "( N = ANOTHER ANESTHETIC )": GOSUB 90
     00: IF RS$ = "N" THEN 5510
5560  IF TF = 12 THEN AL$(2) = "DIP FOR KILLING"
5570  IF TF = 14 THEN  RUN
5580  HOME : GOSUB 2000: RUN
5598  REM
5599  REM  ### DISEASE CASE REPORTS ##
5600  HOME : VTAB 11: HTAB 13: PRINT "W O R K I N G": PRINT D$;"RUN";ML$(
     MF)
5998  REM
5999  REM ## CHEMICAL NOTES ##
6000  HOME : VTAB 3: FOR I = 1 TO 14: PRINT  SPC( 3 -  LEN ( STR$ (I)));I
     ;"  ";TL$(I + 10): NEXT : PRINT : FOR I = 1 TO 6: PRINT  SPC( 3 -  LEN
     ( STR$ (I + 14)));I + 14;"  ";DIL$(I): NEXT : FOR I = 1 TO 3: VTAB 1
     7 + I: HTAB 23: PRINT  SPC( 3 -  LEN ( STR$ (I + 20)));I + 20;"  ";A
     NL$(I): NEXT
6002  VTAB 23: HTAB 14: PRINT ", BLEACH, HYPOCHLORITES": VTAB 1
6010 V = 1:U = 23:X$ = "": GOSUB 9100: HOME : IF F < 15 THEN  PRINT TL$(F
      + 10);" :": GOTO 6040
6020  IF F < 21 THEN  PRINT DIL$(F - 14);" :": GOTO 6040
6030  PRINT ANL$(F - 20);" :"
6040  VTAB 3: ON F GOSUB 9310,9320,9330,9340,9350,9360,9370,9380,9390,940
     0,9410,9410,9430,9440,9310,8810,9380,9400,8820,8830,8900,8910,8920
6050  VTAB 22: HTAB 14: PRINT "(Y = RETURN TO MENU)": PRINT  SPC( 13);"(N
      = SELECT ANOTHER NOTE)": GOSUB 9000: IF RS$ = "N" THEN 6000
6060  RUN
```

```
8798  REM
8799  REM   ##  DISINFECTANT NOTES  ##
8810  PRINT "1 50% ACTIVE INGREDIENT IN LIQUID FORM. ": PRINT : PRINT "2
      100% ACTIVE INGREDIENT IN POWDER.      ": PRINT : PRINT "3 USE AS GEN
      ERAL HATCHERY DISINFECTANT. ": PRINT
8811  PRINT "4 NOT RECOMMENDED FOR USE DIRECTLY ON   ": PRINT "  FISH.": PRINT
      : PRINT : RETURN
8820  PRINT "1 ACTIVE INGREDIENT 1.6% (16,000 MG/L)  ": PRINT "  AVAILABL
      E IODINE.": PRINT : PRINT : PRINT "2 IF USED TO DISINFECT EGGS, CHEC
      K PH   ": PRINT "  AND ADJUST TO 7.0 WITH": PRINT
8821  PRINT "  SODIUM BICARBONATE (BAKING SODA).     ": PRINT : PRINT "3
      SINCE WESCODYNE CONTAINS A WETTING    ": PRINT "  AGENT, IT IS A GOO
      D GENERAL PURPOSE   ": PRINT "  DISINFECTANT BUT RINSE WELL AFTER US
      E.": RETURN
8829  REM   ## CHLORINE NOTES ##
8830  HOME : PRINT "CHLORINE": PRINT "DOMESTIC BLEACH": PRINT "SODIUM HYP
      OCHLORITE": PRINT "CALCIUM HYPOCHLORITE": PRINT : PRINT "1.USE FOR P
      OND OR EQUIPMENT DISINFECTION  ONLY.  DO NOT USE IN NATURAL OR SEMI-
         NATURAL CHANNELS, IT KILLS VEGETATION."
8831  PRINT "2.USE WITH EXTREME CAUTION, IT IS HIGHLY  TOXIC AT VERY LOW
      CONCENTRATIONS.      ": PRINT : PRINT "3.ALWAYS CONSIDER EFFECTS OF T
      HE SPENT    CHEMICAL ON THE ENVIRONMENT.            NEUTRALIZE WITH
      SODIUM THIOSULFATE"
8832  PRINT "  (NA2SO2O3) BEFORE RELEASE INTO ANY      WATER SYSTEM (111.
      3 MG/L SOLUTION).    ": GOSUB 9200: VTAB 21: PRINT "4.HIGH-TEMPERATUR
      ES AND LOW PH OVER A     LONG TIME GIVE THE MOST EFFECTIVE       BAC
      TERICIDAL ACTION.": PRINT
8833  PRINT "5.IF NECCESSARY, ADD ACID (H2SO4) SLOWLY  TO THE WATER TO LO
      WER PH AND INCREASE   THE AMOUNT OF FREE CHLORINE, OR USE     HYPOCH
      LOROUS ACID IN SOLUTION. DO NOT   INHALE THE CHLORINE GAS PRODUCED B
      Y     THESE MIXTURES."
8834  PRINT : PRINT "5.ACTIVE INGREDIENT WILL VARY DEPENDING   ON THE TYP
      E OF CHLORINE USED.  CONSULT  THE LABEL.": PRINT : PRINT : PRINT : PRINT
      : RETURN
8849  REM  ## CHLORINE PROCEDURES ##
8860  PRINT "CHLORINE : BUCKET WASHING / DISINFECTION": PRINT "******** P
      ROCEDURE IS IMPORTANT ********": PRINT "1 PREPARE CONTAINER OF CHLOR
      INE SOLUTION": PRINT "2 PREPARE NEUTRALIZING TUB  178 MG/L    "
8861  PRINT "  NA2S2O3  (SODIUM THIOSULFATE)": PRINT : PRINT "3 WASH BUCK
      ETS IN CHLORINE SOL.": PRINT : PRINT "4 RINSE IN NEUTRALIZING SOL.":
       PRINT : PRINT "5 RINSE IN WATER (HOSE OFF) & SET TO DRY"
8862  PRINT "6 NEUTRALIZE CHLORINE SOLUTION BEFORE   ": PRINT "  RELEASIN
      G (703 MG NA2S2O3 PER LITER)": RETURN
8870  PRINT "CHLORINE : POND DISINFECTION": PRINT : PRINT "******** PROCE
      DURE IS IMPORTANT ********": PRINT "1 PREPARE CONTAINER OF CHLORINE
      SOLUTION": PRINT "2 SEQUENCE IS IMPORTANT, WAIT 15 MIN.   "
8871  PRINT "3 MIX IN H2SO4.  DO THIS SLOWLY OR        CHLORINE GAS FORMS
      .": PRINT : PRINT "5 ALLOW 10 HOURS FOR DISINFECTION.": PRINT : PRINT
      "6 NEUTRALIZE WITH SODIUM THIOSULFATE    ": PRINT "  (NA2S2O3)   111
      .3 MG / LITER  SOL. ": RETURN
```

```
8898  REM
8899  REM  ## ANESTHETIC NOTES ##
8900  PRINT "1 ACTIVE INGREDIENT 100% IN POWDER FORM.  ": PRINT : PRINT "
     2 TEST EACH BATCH FOR FISH TOXICITY      ": PRINT "  BEFORE ALLOWING
     GENERAL HATCHERY USE, ": PRINT "  THERE HAVE BEEN SOME TOXIC LOTS.
        ": PRINT
8901  PRINT "3 IN VERY SOFT WATER SOLUTIONS OF MS-222": PRINT "  MAY REQU
     IRE BUFFERING.  ADJUST TO      ": PRINT "  PH 7.0 USING SODIUM BICARB
     ONATE": PRINT : PRINT "  (BAKING SODA).": PRINT : GOSUB 9200
8902  VTAB 22: PRINT "4 *** ACTUAL AMOUNT NEEDED FOR DESIRED  ": PRINT "
         RESULTS DEPENDS ON WATER TEMP,     ": PRINT "       SPECIES, AGE
     & HEALTH.    ": PRINT : PRINT : RETURN
8910  PRINT : PRINT "1 ACTIVE INGREDIENT 100% IN LIQUID FORM.": PRINT : PRINT
     "2 STANDARD DOSAGE MAY BECOME LETHAL AT  ": PRINT "  HIGHER TEMP. OR
      LARGER FISH SIZES.": PRINT
8911  PRINT : PRINT "3 STORE IN DARK BOTTLES AWAY FROM LIGHT ": PRINT "
     IN A COOL LOCATION.": PRINT : PRINT : PRINT "4 MIX WELL BEFORE USE T
     O AVOID HOT SPOTS": PRINT " OF 2-PHENOXY IN BATH."
8912  GOSUB 9200: VTAB 22: PRINT "5 DOES NOT DISSOLVE WELL IN COLD WATER.
       ": PRINT : PRINT "6 *** ACTUAL AMOUNT NEEDED FOR DESIRED  ": PRINT
     "       RESULTS DEPEND ON WATER TEMP,     ": PRINT "       SPECIES, AGE
      & HEALTH.": PRINT : PRINT : RETURN
8920  PRINT "1 MAINTAIN PH BETWEEN 6.0 - 6.5 WITH      0.122 GM SODIUM BI
     CARBONATE / LITER.  ": PRINT "2 OPT. CO2 CONCENTRATION = 200-400 MG/
     L.": PRINT "3 USE ANHYDROUS CO2 GAS ONLY.": PRINT
8921  PRINT "4 INTRODUCE CO2 SLOWLY TO MAINTAIN O2      LEVEL ABOVE 6 PPM.
     ": PRINT : PRINT "5 USE A VERY LARGE AIRSTONE AND TURN ON   GAS BEFO
     RE IMMERSING STONE.    ": PRINT
8922  PRINT "6 ADD ADDITIONAL CO2 AS REQUIRED TO        MAINTAIN DESIRED
     DEGREE OF              IMMOBILIZATION.": GOSUB 9200: VTAB 20: PRINT
     "7 RECOMMENDED WHEN FISH ARE FOR HUMAN     CONSUMPTION.": PRINT
8923  PRINT "8 FOR FURTHER INSTRUCTIONS, SEE YOUR      NEIGHBOURHOOD BIOL
     OGIST": PRINT : PRINT : PRINT : RETURN
8999  REM  ## OK (Y/N)
9000  VTAB 23: HTAB 1: PRINT "OK (Y/N)":V = 23:H = 10: GOSUB 9010: RETURN

9010  VTAB V: HTAB H: GET RS$: IF  ASC (RS$) = 18 THEN  RUN
9015  IF  ASC (RS$) = 16 THEN  GOSUB 9050: GOTO 9000
9020  IF RS$ <  > "Y" AND RS$ <  > "N" THEN 9010
9025 RS = 1: IF RS$ = "Y" THEN RS = 2
9030  VTAB 23: HTAB 1: CALL  - 868: POKE  - 16368,0: RETURN
9049  REM  ## SCREEN DUMP ##
9050 Q$ = "": FOR I = 1 TO 42:Q$ = Q$ + "-": NEXT : VTAB 23: HTAB 39: POKE
     33,1: POKE 32,38: POKE 34,23: PR# 1: PRINT " ": PRINT Q$: FOR VV = 1
      TO 23:RS$ = "!"
9060  FOR HH = 1 TO 40:RS$ = RS$ +  CHR$ ( SCRN( HH - 1,2 * (VV - 1)) + 1
     6 *  SCRN( HH - 1,2 * (VV - 1) + 1)): NEXT
9070  PRINT RS$ + "!": NEXT : PRINT Q$: PR# 0: POKE 34,0: POKE 32,0: POKE
     33,40: RETURN
9099  REM   ## SELECT
9100  VTAB V: HTAB 4: PRINT "SELECT ";X$;" #":H = 13 +  LEN (X$): VTAB V:
      HTAB H: POKE 33,38: INPUT "";F$: IF F$ <  > "" THEN  IF  ASC (F$) =
     18 THEN  RUN
9110  IF F$ <  > "" THEN  IF  ASC (F$) = 16 THEN  GOSUB 9050: GOTO 9100
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9120 F =  VAL (F$): IF F > U OR F < 1 THEN 9100
9130  POKE 33,40: RETURN
9198  REM
9199  REM  ##  CONTINUE  ##
9200  VTAB 23: HTAB 1: PRINT "(PRESS ANY KEY TO CONTINUE)": VTAB 23: HTAB
     40: GET RS$: IF  ASC (RS$) = 18 THEN  RUN
9210  VTAB 23: HTAB 1: CALL  - 868: IF  ASC (RS$) = 16 THEN  GOSUB 9050: GOTO
     9200
9220  RETURN
9298  REM
9299  REM   ## CHEMICAL NOTES ##
9300  PRINT "GENERAL :": PRINT : PRINT "1 ALWAYS HAVE CALCULATIONS CHECKE
     D BY": PRINT "  A SECOND PERSON.": PRINT : PRINT "2 IF NOT SURE OF F
     ISH REACTION TO A": PRINT "  TREATMENT, TEST A CONTROL GROUP FIRST."

9301  PRINT "3 ALWAYS CONSIDER THE ENVIRONMENTAL ": PRINT "  IMPACT OF TH
     E SPENT CHEMICAL.": PRINT : PRINT "4 ALL CHEMICALS USED TO TREAT FIS
     H": PRINT "  SHOULD BE HANDLED WITH CARE.": PRINT : PRINT "5 USE REC
     OMMENDED CHEMICAL DOSAGES.": RETURN
9310  PRINT "1 KNOWN AS BETADINE OR BRIDINE.": PRINT : PRINT "2 10,000 MG
     /L AVAILABLE IODINE (1% A.I.)": PRINT "3 USE FOR EGG OR EQUIPMENT DI
     SINFECTION.": PRINT : PRINT "4 IF USED TO DISINFECT EGGS, CHECK PH."

9311  PRINT : PRINT "  ADJUST TO 7.0 WITH SODIUM BICARBONATE ": PRINT "
     (BAKING SODA) BEFORE USE.": PRINT : PRINT : PRINT "5 OVADINE AND WES
     CODYNE ARE ALTERNATIVE ": PRINT "  DISINFECTANTS.": RETURN
9320  PRINT "1  GALLIMYCIN IS A TRADE NAME.": PRINT : PRINT : PRINT "2  U
     SE THE PHOSPHATE FORM OF ERYTHRO.   ": PRINT : PRINT "3  REFRIGERATI
     ON IS PREFERRED BUT IS": PRINT : PRINT "  NOT NECESSARY.  KEEP COOL
      AND DRY.  ": PRINT
9321  PRINT "4  ABSORPTION RATE OF ERYTHROMYCIN       ": PRINT "  PHOSPHA
     TE IS SIGNIFICANTLY INCREASED ": PRINT "  BY SURFACTANTS ADDED TO T
     HE": PRINT : PRINT "  DRUG BATH.": RETURN
9330  PRINT "1 DO NOT USE AT TEMPERATURES ABOVE 18'. ": PRINT "2 IN VERY
     SOFT WATER DO NOT USE AT": PRINT : PRINT "  CONCENTRATIONS > 25 PPM.
     ": PRINT : PRINT "3 HANDLE WITH CARE, FORMALDEHYDE IS": PRINT : PRINT
     "  TOXIC TO HUMANS."
9331  PRINT : PRINT "4 DO NOT ALLOW TO FREEZE.  STORE AT": PRINT : PRINT
     "  ROOM TEMPERATURE.": PRINT : PRINT "5 USE FORMALIN THAT HAS BEEN S
     TABILIZED": PRINT : PRINT "  WITH METHANOL.": GOSUB 9200: VTAB 21: PRINT
     "6 IN EARTHEN PONDS FORMALIN MAY KILL": PRINT :
9332  PRINT "  VEGETATION.": PRINT : PRINT "7 FORMALIN = 37 GM OF FORMALD
     EHYDE GAS": PRINT "   (100%)    DISSOLVED IN 100 ML H2O": PRINT "
              (37% FORMALDEHYDE)": PRINT : PRINT : PRINT : PRINT
9333  RETURN
9340  PRINT "1 THE HIGH PRICE OF FURANACE REQUIRES": PRINT : PRINT "  TRE
     ATMENTS TO BE CARRIED OUT IN AS": PRINT : PRINT "  SMALL A VOLUME OF
      WATER AS POSSIBLE.  ": PRINT : PRINT "2 AUXILIARY AERATION MAY BE N
     ECESSARY."
9341  PRINT : PRINT "3 ALSO KNOWN AS FURPYRIDINOL.": RETURN
9350  PRINT "1 MIX WITH FOOD JUST BEFORE USING": PRINT : PRINT "  ENZYMES
      IN MOIST DIETS RAPIDLY": PRINT : PRINT "  INACTIVATE THE DRUG. ": PRINT
     : PRINT : PRINT "2 HANDLE WITH CARE, DO NOT INHALE DUST"
9351  PRINT : PRINT "  AVOID CONTACT WITH SKIN": PRINT : PRINT "  ALSO KN
     OWN AS NF180, FUROXONE OR       ": PRINT "  NITROFURAN.": RETURN
```

```
9360  PRINT "1 IS ERYTHROMYCIN WITH A SUGAR CARRIER. ": PRINT : PRINT "2
      A COMMERCIAL PRODUCT CONTAINING:       ": PRINT "  13 GM WATER SOLUBL
      E ERYTHROMYCIN       ": PRINT "  PHOSPHATE / 100 GRAMS, OR": PRINT
9361  PRINT "  11.56 GRAMS ERYTHROMYCIN / 100 GRAMS. ": PRINT : PRINT "3
      USE 2 PPM FOR 60 MIN WATER HARDENING  ": PRINT "  OF EGGS TO PREVENT
       BKD.": RETURN
9370  PRINT "1 DO NOT USE IN CONTACT WITH ZINC.": PRINT : PRINT "2 USE ZI
      NC - FREE FORM OF THE DYE.": PRINT : PRINT "3 AVOID SKIN CONTACT AND
       DO NOT INHALE. ": PRINT "4 USE WITH EXTREME CAUTION.  TOXIC TO": PRINT

9371  PRINT "  SOME SPECIES AND SIZES OF FISH.       ": PRINT "5 REPORTED
      TO BE CARCINOGENIC. ": PRINT : PRINT : RETURN
9380  PRINT "1 ACTIVE INGREDIENT 1 % (10000 MG/L)    ": PRINT "  AVAILABL
      E IODINE.": PRINT : PRINT : PRINT "2 OVADINE CONTAINS SOME BUFFER, H
      OWEVER ": PRINT "  CHECK PH BEFORE USING.  IF NECESSARY,"
9381  PRINT "  ADJUST PH TO 7.0 USING SODIUM         ": PRINT "  BICARBON
      ATE (BAKING SODA).": RETURN
9390  PRINT "1 IN VERY SOFT WATER USE WITH CAUTION.": PRINT : PRINT : PRINT
      "2 10 PPM IS HIGHLY TOXIC TO SALMONIDS.  ": PRINT
9391  PRINT "3 AVAILABLE AT LOCAL DRUG STORES.       ": PRINT : PRINT "4
      EXPLOSIVE IF BROUGHT INTO CONTACT WITH": PRINT "  READILY OXIDIZABLE
       SUBSTANCES          ": PRINT "  (EG. GLYCEROL).": RETURN
9400  PRINT "1 EXTREMELY TOXIC AT HIGH TEMPERATURES": PRINT : PRINT "  AN
      D LOW WATER HARDNESS.  TEST A       ": PRINT "  CONTROL GROUP FIRST.
      ": PRINT : PRINT : PRINT "2 ALSO KNOWN AS BENZALKONIUM CHLORIDE.  ":
       PRINT
9401  PRINT "3 RECOMMENDED FOR DISINFECTION OF EQUIP.": PRINT "  NON-CORR
      OSIVE BUT HAS HIGH TOXICITY   ": PRINT "  TO FISH.": PRINT : PRINT :
       PRINT "4 CHECK % ACTIVE INGREDIENT LEVEL.": RETURN
9410  PRINT "1 DO NOT FEED LESS THAN THE RECOMMENDED": PRINT : PRINT "  A
      MOUNT.": PRINT : PRINT : PRINT "2 STABLE FOR 5 - 10 YEARS IF STORED
      IN A": PRINT "  COOL DRY PLACE.": PRINT : PRINT
9411  PRINT "3 SULFAMERAZINE AND SULFAMETHAZINE      ": PRINT "  CAN BE S
      UBSTITUTED FOR EACH OTHER     ": PRINT "  IN MOST CASES.": RETURN
9430  PRINT "1 DRUG RESISTANCE BY BACTERIAL PATHOGEN": PRINT : PRINT "  M
      AY DEVELOP IF USED IMPROPERLY.": PRINT : PRINT "  DO NOT FEED LESS T
      HAN THE RECOMMENDED": PRINT : PRINT "  AMOUNT.": RETURN
9440  PRINT "1 SEE MANUFACTURER'S INSTRUCTIONS FOR": PRINT : PRINT "  APP
      LICATION.": RETURN
9449  REM  ## APPLICATION NOTES
9450  HOME : VTAB 4: PRINT "   DEFINITION OF SELECTED APPLICATION  ": PRINT
      "*****************************************": VTAB 9: PRINT AL$(AF);"
      :": PRINT : ON AF GOSUB 9460,9465,9470,9475,9480,9485,9486: RETURN
9460  PRINT "ONE HOUR EXPOSURE TO MODERATE          ": PRINT "CONCENTRAT
      IONS OF CHEMICALS WITH": PRINT : PRINT "INFLOWING WATER.": RETURN
9465  PRINT "ONE HOUR EXPOSURE TO A CHEMICAL WITH THE": PRINT "WATER TURN
      ED OFF.": RETURN
9470  PRINT "EXPOSURE TO LOW CONCENTRATIONS OF       ": PRINT "CHEMICALS
      FOR PROLONGED PERIODS OF TIME ": PRINT "(4 - 12 HOURS)": RETURN
9475  PRINT "A QUICK EXPOSURE TO HIGH CONCENTRATIONS ": PRINT "OF CHEMICA
      LS FOR 1 TO 10 MIN.": RETURN
9480  PRINT "A SINGLE FLUSH THROUGH THE SYSTEM": RETURN
```

```
9485  PRINT "DRUGS MIXED WITH FOOD.  THIS TREATMENT  ": PRINT "ASSUMES TH
      AT EACH FISH RECEIVES IT'S    ": PRINT "CALCULATED ALLOTMENT, THEREF
      ORE THE     ": PRINT "POND WEIGHT ESTIMATE MUST BE AS ACCURATE": PRINT
      "AS POSSIBLE.": RETURN
9486  PRINT "ANTIBIOTIC INJECTED INTO THE DORSAL     ": PRINT "SINUS LOCA
      TED CENTER OF THE BACK,       ": PRINT "IMMEDIATELY ANTERIOR TO THE
      DORSAL FIN. ": PRINT "INSERT NEEDLE VERTICALLY.  FOR A 2-LB.  "
9487  PRINT "FISH THE SINUS IS APPROXIMATELY 1 CM    ": PRINT "BELOW THE
      SKIN.": RETURN
9498  REM
9499  REM   ** PRINT STANDARD DOSE **
9500 LD =  LEN (SD$(SD)) / 3 - 1: FOR I = 1 TO LD:L$(I) = "":N$(I) =  MID$
      (SD$(SD),I * 3 + 1,3): NEXT : PRINT "STANDARD DOSE : (ACTIVE INGREDI
      ENT)": PRINT "==============": PRINT :X$ = "CONSECUTIVE DAYS":T(1) =
      TF: IF TF > 24 THEN 9550
9510 L$(1) =  MID$ ("PPMPPMPPMPPMPPMGMSMGS",AF * 3 - 2,3): IF MF = 6 AND
      AF = 7 THEN L$(1) = "MGS A.I./ LB FISH"
9520 L$(2) =  MID$ ("DAYMINHRSMIN   DAY   ",AF * 3 - 2,3): IF MF = 6 AND
      AF = 6 THEN L$(2) = X$
9530  IF LD = 3 THEN L$(3) = X$
9540  GOTO 9570
9550 L$(1) = "GMS":L$(2) = "GMS":L$(3) = X$: IF AF = 3 THEN L$(1) = "PPM"
      :L$(2) = "PPM":L$(3) = "HR":L$(4) = X$
9560 X$ = "13172321232215211522": FOR I = 1 TO 2:T(I) =  VAL ( MID$ (X$,T
      F * 4 - 101 + 2 * I,2)): NEXT
9570  FOR I = 1 TO LD: PRINT "   ";N$(I);" ";L$(I): NEXT
9580  RETURN
9899  REM  ##  LABELS
9900  FOR DF = 1 TO 24: READ DL$(DF): NEXT
9901  FOR TF = 10 TO 29: READ TL$(TF): NEXT
9902  FOR AF = 0 TO 8: READ AL$(AF): NEXT
9903  FOR SF = 1 TO 4: READ SL$(SF): NEXT
9904  FOR DF = 1 TO 24: FOR SF = 1 TO 4: READ DS$(DF,SF): NEXT : NEXT
9905  FOR SD = 1 TO 28: READ SD$(SD): NEXT
9906  FOR UF = 1 TO 10: READ UL$(UF): NEXT
9907  FOR UF = 1 TO 10: READ UC(UF): NEXT
9908  FOR I = 1 TO 6: READ DIL$(I): NEXT : FOR I = 1 TO 3: READ ANL$(I): NEXT

9909  FOR I = 1 TO 14: READ AI(I): NEXT :PL$(1) = "PREVENTION":PL$(2) = "
      CONTROL":PL$(3) = "PREVENT/CONTROL":CL$(1) = "RECTANGULAR":CL$(2) =
      "CIRCULAR":CL$(3) = "OVAL":CL$(4) = "SLOPE-SIDED RACEWAY": RETURN
9910  DATA BACT GILL DISEASE,BKD,COLDWATER DISEASE,COLUMNARIS DISEASE, CO
      STIA, CRYPTOBIA, ENTERIC REDMOUTH, EPISTYLIS, FUNGUS, FURUNCULOSIS,
      FUSIFORM GILL DISEASE, GLOCHIDIA (CLAM)
9911  DATA GYRODACTYLUS,HEXAMITA,ICH, MOTILE AEROMONAS SEPTICEMIA, MYXOBA
      CTERIAL GILL DISEASE, PSEUDOMONAS INFECTION, SALMONCOLA, SPOROCYTOPH
      AGA, TRICHODINA, TRICHOPHYRA, TUBERCULOSIS,VIBRIOSIS
9920  DATA NONE, BETADINE, ERYTHROMYCIN, FORMALIN, FURANACE, FURAZOLIDONE
      , GALLAMYCIN, MALACHITE, OVADINE, POTASSIUM PERMANGANATE, ROCCAL, SU
      LFAMERAZINE, SULFAMETHAZINE, TERRAMYCIN, VACCINE
9921  DATA FORMALIN-MALACHITE, TERRAMYCIN-SULFAMERAZINE, TERRAMYCIN-SULFA
      METHAZINE, FURAZOLIDONE-SULFAMERAZINE, FURAZOLIDONE-SULFAMETHAZINE
9930  DATA ,1 HR BATH, STATIC BATH, LONG BATH, DIP, FLUSH, ORAL, INJECTED
      , VACCINE
9940  DATA ADULT/FINGERLING, FRY, SAC FRY,EGG
```

Case Reporter

```
90  REM  *** CASE REPORTER  JULY 6,1983 ***
91  REM  *** ANNE KLING ***
100  HOME
110 FS$(1) = "DDMMYY":SM$(2) = "DDMMYY":D$ =  CHR$ (4):FF$ =  CHR$ (12):B
     = 6
120  DIM D0(13),D0$(13),D1(13),D1$(13),D6(13),D6$(13),D7(11),D7$(11),DA(1
    0),DA$(10),DB(14),DB$(14),LO$(7,2),CM$(100),ZL(61),CD$(8)
130  GOSUB 9000: REM * READ DATA *
137  REM
138  REM *** LAYOUT MENU ***
139  REM
140  GOSUB 10000: VTAB 4: PRINT "CHOOSE MENU OPTION # "
145 MX = 7
150  FOR I = 1 TO MX: VTAB (V(I)): HTAB 5: PRINT N(I); SPC( 2);MN$(I): NEXT

160 V = 4:H = 21: GOSUB 21000: GOSUB 24000: GOSUB 23000: IF RS$ = "" THEN
    160
165 RS =  VAL (RS$)
170  VTAB (V(RS)): INVERSE : HTAB 8: PRINT MN$(RS): NORMAL
180  GOSUB 26000: IF RS$ = "N" THEN  VTAB (V(RS)): HTAB 8: PRINT MN$(RS):
     GOTO 160
190  ON RS GOTO 1000,2000,3000,4000,5000,6000,7000
200  GOTO 140
999  REM
1000  REM *** INPUT ROUTINE ***
1001  REM
1010  GOSUB 11000: PRINT : GOSUB 11500
1020  GOSUB 12000: PRINT : GOSUB 12500
1030  GOSUB 13000: PRINT : GOSUB 13500
1040  GOSUB 14000: PRINT : GOSUB 14500
1050  GOSUB 15000: PRINT : GOSUB 15500
1060  GOSUB 16000: PRINT : GOSUB 16500
1070  PRINT : GOSUB 17000
1080  GOTO 140
1999  REM
2000  REM *** REVIEW ROUTINE ***
2001  REM
2010  GOSUB 11000: GOSUB 26000: IF RS$ = "N" THEN  VTAB 10: GOSUB 11500
2020  GOSUB 12000: GOSUB 26000: IF RS$ = "N" THEN  GOSUB 12500
2030  GOSUB 13000: GOSUB 26000: IF RS$ = "N" THEN  GOSUB 13500
2040  GOSUB 14000: GOSUB 26000: IF RS$ = "N" THEN  GOSUB 14500
2050  GOSUB 15000: GOSUB 26000: IF RS$ = "N" THEN  GOSUB 15500
2060  GOSUB 16000: GOSUB 26000: IF RS$ = "N" THEN  GOSUB 16500
2070  GOSUB 10000: HTAB 15: PRINT "COMMENTS": PRINT : PRINT
2080  FOR I = 1 TO N: PRINT CM$(I): NEXT : GOSUB 26000: IF RS$ = "N" THEN
     GOSUB 17000
2090  GOTO 140
2999  REM
3000  REM *** HARD COPY OF REPORT ***
3001  REM
3010  PR# 1: GOSUB 11000: PRINT : PRINT : PRINT : GOSUB 12010: PRINT : PRINT
    : PRINT : GOSUB 13010: PRINT :: PRINT : PRINT : GOSUB 14010: PRINT :
     PRINT : PRINT : GOSUB 15010: PRINT : PRINT : PRINT : GOSUB 16010
```

```
3020  PRINT : PRINT : PRINT : PRINT "COMMENTS": PRINT : PRINT : FOR I = 1
      TO N: PRINT CM$(I): PRINT : NEXT
3030  PR# 0: GOTO 140
3999  REM
4000  REM *** WRITE DATA ROUTINE ***
4001  REM
4010  GOSUB 10000:DS$ = "DS " + FS$(1) + " " + DO$( VAL (FS$(4))) + " " +
      FS$(2)
4020  VTAB 4: PRINT "A FILE CONTAINING ALL THE DATA WILL NOW BE SAVED UND
      ER THE NAME :": PRINT : PRINT : PRINT "*"; LEFT$ (DS$,30);"*"
4030  VTAB 11: PRINT "WILL THIS NAME BE SUFFICIENT FOR        IDENTIFICAT
      ION ? <Y/N>": VTAB 12: HTAB 24: GET RS$: PRINT : IF RS$ <  > "Y" AND
      RS$ <  > "N" THEN 4030
4040  IF RS$ = "Y" THEN DS$ =  LEFT$ (DS$,30): GOTO 4060
4050  PRINT : VTAB 15: PRINT "RENAME THE FILE INCLUDING SPECIES": PRINT "
      NEW NAME MUST BE LESS THEN 30 CHARACTERS": PRINT "NOTE : NAME MUST A
      LSO BE UNIQUE !"
4055  VTAB 20: HTAB 32: PRINT "*": VTAB 20: PRINT "*DS ";FS$(1): VTAB 20:
      HTAB 11: INPUT "";RS$
4056 DS$ = "DS " + FS$(1) + RS$
4057  IF  LEN (DS$) > 30 THEN 4020
4060  PRINT D$;"OPEN ";DS$
4070  PRINT D$;"DELETE ";DS$
4080  PRINT D$;"OPEN ";DS$
4090  PRINT D$;"WRITE ";DS$
4100  PRINT 10000 + N
4110  FOR I = 1 TO 8: PRINT FS$(I): NEXT
4120  FOR I = 1 TO 3: PRINT SM$(I): NEXT
4130  FOR J = 0 TO 1: FOR I = 1 TO 7: PRINT LO$(I,J): NEXT I: NEXT J
4140  FOR I = 1 TO 8: PRINT CD$(I): NEXT
4150  FOR I = 1 TO 5: PRINT DM$(I): NEXT
4160  FOR I = 1 TO 5: PRINT FD$(I): NEXT
4170  FOR I = 1 TO 3: PRINT TM$(I): NEXT
4175  FOR I = 1 TO 6: PRINT DV$(I): NEXT
4180  FOR I = 1 TO 8: PRINT W$(I): NEXT
4185  PRINT  STR$ (PF)
4190  FOR I = 1 TO N: PRINT CM$(I): NEXT
4200  PRINT D$;"CLOSE ";DS$
4210  IF PF = 0 THEN 4310
4220 TT$ =  RIGHT$ (DS$, LEN (DS$) - 2)
4230  PRINT D$;"OPEN XR";TT$
4240  PRINT D$;"DELETE XR";TT$
4250  PRINT D$;"OPEN XR";TT$
4260  PRINT D$;"WRITE XR";TT$
4270  FOR I = 1 TO 8: PRINT XD$(I): NEXT
4280  PRINT D$;"CLOSE XR";TT$
4310  GOTO 140
4999  REM
5000  REM *** RETRIEVE DATA ***
5001  REM
5010  PRINT D$;"CATALOG"
5020  PRINT "ALL DISEASE DATA FILES BEGIN WITH 'DS' ": INPUT "CHOOSE ONE
      ";DS$
```

```
5030  PRINT D$;"OPEN ";DS$
5040  PRINT D$;"READ ";DS$
5050  INPUT N:N = N - 10000
5060  FOR I = 1 TO 8: INPUT FS$(I): NEXT
5070  FOR I = 1 TO 3: INPUT SM$(I): NEXT
5080  FOR J = 0 TO 1: FOR I = 1 TO 7: INPUT LO$(I,J): NEXT I: NEXT J
5090  FOR I = 1 TO 8: INPUT CD$(I): NEXT
5100  FOR I = 1 TO 5: INPUT DM$(I): NEXT
5110  FOR I = 1 TO 5: INPUT FD$(I): NEXT
5120  FOR I = 1 TO 3: INPUT TM$(I): NEXT
5125  FOR I = 1 TO 6: INPUT DV$(I): NEXT
5130  FOR I = 1 TO 8: INPUT W$(I): NEXT
5135  INPUT RS$:PF =  VAL (RS$)
5140  FOR I = 1 TO N: INPUT CM$(I): NEXT
5150  PRINT D$;"CLOSE ";DS$
5160  IF PF = 0 THEN 5300
5170 TT$ =  RIGHT$ (DS$, LEN (DS$) - 2)
5180  PRINT D$;"OPEN XR";TT$
5190  PRINT D$;"READ XR";TT$
5200  FOR I = 1 TO 8: INPUT XD$(I): NEXT
5210  PRINT D$;"CLOSE XR";TT$
5300  GOTO 140
5999  REM
6000  REM *** HARD COPY OF BLANK FORM ***
6001  REM
6010  HOME : VTAB 9: HTAB 18: FLASH : PRINT "WARNING": NORMAL
6020  VTAB 11: HTAB 7: PRINT "THIS OUTPUT ERASES ALL DATA"
6030  VTAB 12: HTAB 5: PRINT "IF YOU WISH TO CONTINUE TYPE <C>": VTAB 12:
      HTAB 38: GET RS$
6040  IF RS$ <  > "C" THEN  GOTO 140
6045 UN$ =  CHR$ (223): FOR I = 1 TO 11:Z$ = Z$ + UN$: NEXT
6050 ZZ$ = "*" + Z$
6052  FOR I = 1 TO 9:FS$(I) = Z$:SM$(I) = Z$:DM$(I) = Z$:FD$(I) = Z$:TM$(
     I) = Z$:DV$(I) = Z$:W$(I) = Z$: NEXT
6053  FOR I = 1 TO 8:CD$(I) = Z$: NEXT
6054 K = 1: FOR I = 1 TO 8: FOR J = 1 TO ZL(K):FS$(I) = FS$(I) + UN$: NEXT
     :K = K + 1: NEXT
6056  FOR I = 1 TO 3: FOR J = 1 TO ZL(K):SM$(I) = SM$(I) + UN$: NEXT :K =
     K + 1: NEXT
6058  FOR I = 1 TO 10:LO$ = LO$ + UN$: NEXT
6059  FOR I = 1 TO 7:LO$(I,0) = LO$:LO$(I,1) = LO$: NEXT
6060  FOR I = 1 TO 8: FOR J = 1 TO ZL(K):CD$(I) = CD$(I) + UN$: NEXT :K =
     K + 1: NEXT
6062  FOR I = 1 TO 5: FOR J = 1 TO ZL(K):DM$(I) = DM$(I) + UN$: NEXT :K =
     K + 1: NEXT
6064  FOR I = 1 TO 5: FOR J = 1 TO ZL(K):FD$(I) = FD$(I) + UN$: NEXT :K =
     K + 1: NEXT
6065  FOR I = 1 TO 6: FOR J = 1 TO ZL(K):DV$(I) = DV$(I) + UN$: NEXT :K =
     K + 1: NEXT
6066  FOR I = 1 TO 8: FOR J = 1 TO ZL(K):W$(I) = W$(I) + UN$: NEXT :K = K
      + 1: NEXT
6068  FOR I = 1 TO 8:CD$ = CD$ + UN$: NEXT :CD$(3) = CD$:CD$(6) = CD$
```

```
6070 D0$(0) = ZZ$:D1$(0) = ZZ$:D2$(0) = ZZ$:D3$(0) = ZZ$
6072 D4$(0) = ZZ$:D5$(0) = ZZ$:D6$(0) = ZZ$:D7$(0) = ZZ$
6074 D8$(0) = ZZ$:D8$(0) = ZZ$:D9$(0) = ZZ$:DA$(0) = ZZ$
6076 DB$(0) = ZZ$:DC$(0) = ZZ$:DD$(0) = ZZ$:DE$(0) = ZZ$:DF$(0) = ZZ$
6078  FOR I = 1 TO ZL(K):D0$(0) = D0$(0) + UN$: NEXT :K = K + 1: FOR I =
     1 TO ZL(K):D1$(0) = D1$(0) + UN$: NEXT :K = K + 1
6080  FOR I = 1 TO ZL(K):D2$(0) = D2$(0) + UN$: NEXT :K = K + 1: FOR I =
     1 TO ZL(K):D3$(0) = D3$(0) + UN$: NEXT :K = K + 1
6081  FOR I = 1 TO ZL(K):D4$(0) = D4$(0) + UN$: NEXT :K = K + 1: FOR I =
     1 TO ZL(K):D5$(0) = D5$(0) + UN$: NEXT :K = K + 1
6082  FOR I = 1 TO ZL(K):D6$(0) = D6$(0) + UN$: NEXT :K = K + 1: FOR I =
     1 TO ZL(K):D7$(0) = D7$(0) + UN$: NEXT :K = K + 1
6084  FOR I = 1 TO ZL(K):D8$(0) = D8$(0) + UN$: NEXT :K = K + 1: FOR I =
     1 TO ZL(K):D9$(0) = D9$(0) + UN$: NEXT :K = K + 1
6086  FOR I = 1 TO ZL(K):DA$(0) = DA$(0) + UN$: NEXT :K = K + 1: FOR I =
     1 TO ZL(K):DB$(0) = DB$(0) + UN$: NEXT :K = K + 1
6088  FOR I = 1 TO ZL(K):DC$(0) = DC$(0) + UN$: NEXT :K = K + 1: FOR I =
     1 TO ZL(K):DD$(0) = DD$(0) + UN$: NEXT :K = K + 1
6090  FOR I = 1 TO ZL(K):DE$(0) = DE$(0) + UN$: NEXT :K = K + 1: FOR I =
     1 TO ZL(K):DF$(0) = DF$(0) + UN$: NEXT
6130  PR# 1: PRINT  CHR$ (9);"10L"
6140  PRINT  CHR$ (9);"10L"
6170  GOSUB 11000: PRINT : PRINT : GOSUB 12010
6180  PRINT : PRINT : PRINT "SPECIES OPTIONS"; SPC( 10);"AGE OPTIONS"; SPC(
     10);"SEX OPTIONS": PRINT
6190  FOR I = 1 TO 4: PRINT D0$(I); SPC( 25 -  LEN (D0$(I)));D1$(I); SPC(
     21 -  LEN (D1$(I)));D2$(I): NEXT
6200  FOR I = 5 TO 13: PRINT D0$(I); SPC( 25 -  LEN (D0$(I)));D1$(I): NEXT

6220  PRINT : PRINT : PRINT "SUBMISSION REASONS"; SPC( 7);"STOCK ORIGIN":
      PRINT
6230  FOR I = 1 TO 6: PRINT D3$(I); SPC( 25 -  LEN (D3$(I)));D4$(I): NEXT

6240  PRINT D$;FF$
6250  GOSUB 13000: PRINT : PRINT : GOSUB 14010
6260  PRINT : PRINT : PRINT "SAMPLE TYPE"; SPC( 14);"CONTAINER TYPE": PRINT

6270  FOR I = 1 TO 6: PRINT D5$(I); SPC( 25 -  LEN (D5$(I)));D6$(I): NEXT

6280  FOR I = 7 TO 13: PRINT  TAB( 26);D6$(I): NEXT
6290  PRINT : PRINT : PRINT "DIET"; SPC( 21);"DIET TYPE"; SPC( 12);"FEEDI
     NG METHOD": PRINT
6300  FOR I = 1 TO 3: PRINT D7$(I); SPC( 25 -  LEN (D7$(I)));D8$(I); SPC(
     21 -  LEN (D8$(I)));D9$(I): NEXT
6310  FOR I = 4 TO 11: PRINT D7$(I): NEXT
6320  PRINT D$;FF$
6330  GOSUB 15000: PRINT : PRINT "FOR PREVIOUS DIAGNOSIS, PREVIOUS MEDICA
     TION AND": PRINT "VACCINATION FILL IN DATES IF DONE": PRINT : PRINT
     : GOSUB 16010
6340  PRINT : PRINT : PRINT "BEHAVIOR"; SPC( 11);"GROSS SIGNS"; SPC( 10);
     "RECENT HANDLING": PRINT
6350  FOR I = 1 TO 7: PRINT DA$(I); SPC( 19 -  LEN (DA$(I)));DB$(I); SPC(
     21 -  LEN (DB$(I)));DC$(I): NEXT
6360  FOR I = 8 TO 14: PRINT  SPC( 19);DB$(I): NEXT
6370  PRINT : PRINT : PRINT "WATER SOURCE       WATER HARDNESS": PRINT
6380  FOR I = 1 TO 7: PRINT DE$(I); SPC( 19 -  LEN (DE$(I)));DF$(I): NEXT
```

```
6390  PRINT D$;FF$
6400  PRINT : PRINT "COMMENTS"
6410  FOR I = 1 TO 10: PRINT : PRINT : PRINT : FOR J = 1 TO 6: PRINT Z$;:
      NEXT : NEXT
6420  PR# 0
6430  PRINT : RUN
6999  REM
7000  REM *** GO TO DISEASE MENU ***
7001  REM
7010  PRINT D$;"RUN FISH HEALTH"
8997  REM
8998  REM *** READ DATA AT END ***
8999  REM
9000  FOR I = 1 TO 13: READ D0(I),D0$(I): NEXT
9010  FOR I = 1 TO 13: READ D1(I),D1$(I): NEXT
9020  FOR I = 1 TO 4: READ D2(I),D2$(I): NEXT
9030  FOR I = 1 TO 6: READ D3(I),D3$(I): NEXT
9040  FOR I = 1 TO 4: READ D4(I),D4$(I): NEXT
9050  FOR I = 1 TO 6: READ D5(I),D5$(I): NEXT
9060  FOR I = 1 TO 13: READ D6(I),D6$(I): NEXT
9070  FOR I = 1 TO 11: READ D7(I),D7$(I): NEXT
9080  FOR I = 1 TO 3: READ D8(I),D8$(I): NEXT
9090  FOR I = 1 TO 3: READ D9(I),D9$(I): NEXT
9100  FOR I = 1 TO 10: READ DA(I),DA$(I): NEXT
9110  FOR I = 1 TO 14: READ DB(I),DB$(I): NEXT
9120  FOR I = 1 TO 6: READ DC(I),DC$(I): NEXT
9130  FOR I = 1 TO 2: READ DD(I),DD$(I): NEXT
9140  FOR I = 1 TO 7: READ DE(I),DE$(I): NEXT
9150  FOR I = 1 TO 7: READ DF(I),DF$(I): NEXT
9160  FOR I = 1 TO 7: READ V(I),N(I),MN$(I): NEXT
9165  FOR I = 1 TO 59: READ ZL(I): NEXT
9170  RETURN
9997  REM
9998  REM *** TITLE ***
9999  REM
10000  HOME : VTAB 1: HTAB 14: PRINT "CASE REPORTER"
10010  VTAB 2: HTAB 14: PRINT "=============="
10020  RETURN
10997  REM
10998  REM *** PRINT PAGE ONE ***
10999  REM
11000  GOSUB 10000
11010  VTAB 4: HTAB 1: PRINT "DATE : ";FS$(1)
11020  VTAB 6: PRINT "SAMPLE SITE : ";FS$(2)
11030  VTAB 8: PRINT "CONTRIBUTOR : ";FS$(3)
11040  VTAB 10: PRINT "SPECIES : ";D0$( VAL (FS$(4)))
11045  IF PF = 1 AND FS$(4) = "13" THEN  VTAB 10: HTAB 11: CALL  - 868: VTAB
     10: HTAB 11: PRINT XD$(1)
```

```
11050  VTAB 12: PRINT "AGE : ";D1$( VAL (FS$(5)))
11055  IF PF = 1 AND FS$(5) = "13" THEN  VTAB 12: HTAB 7: CALL  - 868: VTAB
     12: HTAB 7: PRINT XD$(2)
11060  VTAB 14: PRINT "LENGTH (MM) : ";FS$(6)
11070  VTAB 16: PRINT "WEIGHT (GM) : ";FS$(7)
11080  VTAB 18: PRINT "SEX : ";D2$( VAL (FS$(8)))
11090  RETURN
11497  REM
11498  REM *** INPUT PAGE ONE ***
11499  REM
11500 V = 4:H = 7:B = 6:RS$ = FS$(1): GOSUB 21000: GOSUB 22000: GOSUB 250
     00:FS$(1) = RS$: GOSUB 28000
11510 V = 6:H = 14:RS$ = FS$(2): GOSUB 21000:FS$(2) = RS$: GOSUB 28000
11520 V = 8:H = 14:RS$ = FS$(3): GOSUB 21000:FS$(3) = RS$: GOSUB 28000
11530 MN = 1:MX = 13:V = 10: FOR I = 1 TO MX: VTAB V + I: HTAB 21: PRINT
     D0(I); SPC( 3 -  LEN ( STR$ (D0(I))));D0$(I): NEXT
11540 V = 10:H = 10:RS$ = FS$(4): GOSUB 21000: GOSUB 23000:FS$(4) = RS$:R
     S$ = D0$( VAL (FS$(4))): GOSUB 28000
11542 RR$ = FS$(4):XC = 1: GOSUB 31000: GOSUB 28000
11550 V = 11:H = 21:BL = MX: GOSUB 27000
11560 V = 10:MX = 13: FOR I = 1 TO MX: VTAB V + I: HTAB 23: PRINT " ";D1(
     I); SPC( 3 -  LEN ( STR$ (D1(I))));D1$(I): NEXT
11570 V = 12:H = 6:RS$ = FS$(5): GOSUB 21000: GOSUB 23000:FS$(5) = RS$:RS
     $ = D1$( VAL (FS$(5))): GOSUB 28000
11572 RR$ = FS$(5):XC = 2: GOSUB 31000: GOSUB 28000
11580 V = 11:H = 24:BL = MX: GOSUB 27000
11585 V = 12:H = 6: GOSUB 28000
11590 V = 14:H = 14:RS$ = FS$(6): GOSUB 21000:FS$(6) = RS$: GOSUB 28000
11600 V = 16:H = 14:RS$ = FS$(7): GOSUB 21000:FS$(7) = RS$: GOSUB 28000
11610 V = 19:MN = 1:MX = 4: FOR I = 1 TO MX: VTAB V: HTAB 24: PRINT D2(I)
     ;" ";D2$(I):V = V + 1: NEXT
11620 V = 18:H = 6:RS$ = FS$(8): GOSUB 21000: GOSUB 23000:FS$(8) = RS$:RS
     $ = D2$( VAL (FS$(8))): GOSUB 28000
11630 V = 19:H = 24:BL = MX: GOSUB 27000
11640  GOSUB 26000: IF RS$ = "N" THEN 1010
11650  RETURN
11997  REM
11998  REM *** PRINT PAGE TWO ***
11999  REM
12000  GOSUB 10000
12010  VTAB 4: PRINT "REASON FOR SUBMISSION: ";D3$( VAL (SM$(1)))
12015  IF PF = 1 AND SM$(1) = "6" THEN  VTAB 4: HTAB 24: CALL  - 868: VTAB
     4: HTAB 24: PRINT XD$(3)
12020  VTAB 6: PRINT "DATE COLLECTED : ";SM$(2)
12030  VTAB 8: PRINT "STOCK ORIGIN : ";D4$( VAL (SM$(3)))
12040  VTAB 10: PRINT  TAB( 16);"LOSSES    WATER TEMP 'C"
12050  VTAB 11: PRINT "TODAY'S   (7)  ";LO$(1,0); SPC( 11 -  LEN (LO$(1,0
     )));LO$(1,1)
12060  VTAB 12: PRINT "PAST WEEK (6)  ";LO$(2,0); SPC( 11 -  LEN (LO$(2,0
     )));LO$(2,1)
12070 V = 13:J = 5: FOR I = 3 TO 7: VTAB V: PRINT "          (";J;")  ";L
     O$(I,0); SPC( 11 -  LEN (LO$(I,0)));LO$(I,1):V = V + 1:J = J - 1: NEXT
```

```
12080  RETURN
12497  REM
12498  REM *** INPUT PAGE TWO ***
12499  REM
12500 V = 19: FOR I = 1 TO 3: VTAB V: HTAB 1: PRINT D3(I);" ";D3$(I):V =
     V + 1: NEXT
12510 V = 19: FOR I = 4 TO 6: VTAB V: HTAB 25: PRINT D3(I);" ";D3$(I):V =
     V + 1: NEXT
12520 V = 4:H = 23:MX = 6:RS$ = SM$(1): GOSUB 21000: GOSUB 23000:SM$(1) =
     RS$:RS$ = D3$( VAL (SM$(1))): GOSUB 28000
12522 RR$ = SM$(1):XC = 3: GOSUB 31000: GOSUB 28000
12530 V = 19:BL = 3:H = 1: GOSUB 27000
12540 V = 6:H = 17:RS$ = SM$(2): GOSUB 21000: GOSUB 22000: GOSUB 25000:SM
     $(2) = RS$: GOSUB 28000
12550 V = 19: FOR I = 1 TO 4: VTAB V: HTAB 15: PRINT D4(I);" ";D4$(I):V =
     V + 1: NEXT
12560 V = 8:H = 15:MX = 4:RS$ = SM$(3): GOSUB 21000: GOSUB 23000:SM$(3) =
     RS$:RS$ = D4$( VAL (SM$(3))): GOSUB 28000
12570 V = 19:BL = 4:H = 1: GOSUB 27000
12580 V = 11: FOR I = 1 TO 7:H = 15:RS$ = LO$(I,0): GOSUB 29000:LO$(I,0) =
     RS$:H = 26:RS$ = LO$(I,1): GOSUB 29000:LO$(I,1) = RS$:V = V + 1: NEXT

12590  GOSUB 26000: IF RS$ = "N" THEN 1020
12600  RETURN
12997  REM
12998  REM *** PRINT PAGE THREE ***
12999  REM
13000  GOSUB 10000
13010  VTAB 4: PRINT "SAMPLE SIZE : ";CD$(1)
13020  VTAB 5: PRINT "SAMPLE TYPE : ";D5$( VAL (CD$(2)))
13025  IF PF = 1 AND CD$(2) = "6" THEN  VTAB 5: HTAB 15: CALL  - 868: VTAB
     5: HTAB 15: PRINT XD$(4)
13030  VTAB 7: PRINT "NO. AFFECTED CONTAINERS : ";CD$(3)
13040  VTAB 9: PRINT "CONTAINER I.D. : ";CD$(4)
13050  VTAB 10: PRINT "CONTAINER TYPE : ";D6$( VAL (CD$(5)))
13055  IF PF = 1 AND CD$(5) = "13" THEN  VTAB 10: HTAB 18: CALL  - 868: VTAB
     10: HTAB 18: PRINT XD$(5)
13060  VTAB 11: PRINT  TAB( 2)"SIZE    WIDTH : ";DM$(1)
13080  VTAB 12: PRINT  TAB( 9)"LENGTH : ";DM$(2)
13090  VTAB 13: PRINT  TAB( 10)"DEPTH : ";DM$(3)
13100  VTAB 14: PRINT  TAB( 7)"DIAMETER : ";DM$(4)
13110  VTAB 15: PRINT  TAB( 8);"UNKNOWN : ";DM$(5)
13120  VTAB 17: PRINT "  LOAD (FISH/CONTAINER) : ";CD$(6)
13130  VTAB 18: PRINT "  POND INFLOW : ";CD$(7)
13135  VTAB 19: PRINT "  POND VELOCITY : ";CD$(8)
13140  RETURN
13497  REM
13498  REM *** INPUT PAGE THREE ***
13499  REM
13500 V = 4:H = 14:RS$ = CD$(1): GOSUB 21000: GOSUB 24000:CD$(1) = RS$: GOSUB
     28000
13510  VTAB 19: CALL  - 868:V = 19: FOR I = 1 TO 3: VTAB V: HTAB 5: PRINT
     D5(I);" ";D5$(I): VTAB V: HTAB 25: PRINT D5(I + 3);" ";D5$(I + 3):V =
     V + 1: NEXT
```

```
13520 V = 5:H = 14:MX = 6:RS$ = CD$(2): GOSUB 21000: GOSUB 23000:CD$(2) =
     RS$:RS$ = D5$( VAL (CD$(2))): GOSUB 28000
13522 RR$ = CD$(2):XC = 4: GOSUB 31000: GOSUB 28000
13530 V = 19:BL = 3:H = 5: GOSUB 27000
13532  VTAB 19: HTAB 2: PRINT "POND VELOCITY : ";CD$(8)
13540 V = 7:H = 26:RS$ = CD$(3): GOSUB 21000: GOSUB 24000:CD$(3) = RS$: GOSUB
     28000
13550 V = 9:H = 17:RS$ = CD$(4): GOSUB 21000:CD$(4) = RS$: GOSUB 28000
13555 V = 17:BL = 6:H = 1: GOSUB 27000
13560 V = 16:MX = 13: FOR I = 1 TO 6: VTAB V + I: HTAB 1: PRINT D6(I); SPC(
     3 -  LEN ( STR$ (D6(I))));D6$(I);: HTAB 16: PRINT D6(I + 6); SPC( 3 -
      LEN ( STR$ (D6(I + 6))));D6$(I + 6): NEXT
13570  VTAB 22: HTAB 30: PRINT D6(13);" ";D6$(13);
13580 V = 10:H = 17:RS$ = CD$(5): GOSUB 21000: GOSUB 23000:CD$(5) = RS$:R
     S$ = D6$( VAL (CD$(5))): GOSUB 28000
13582 RR$ = CD$(5):XC = 5: GOSUB 31000: GOSUB 28000
13590 V = 17:BL = 6:H = 1: GOSUB 27000
13591  VTAB 17: HTAB 2: PRINT "LOAD (FISH/CONTAINER) : ";CD$(6)
13592  VTAB 18: HTAB 2: PRINT "POND INFLOW : ";CD$(7)
13594  VTAB 19: HTAB 2: PRINT "POND VELOCITY : ";CD$(8)
13600 V = 11:H = 17: FOR I = 1 TO 5:RS$ = DM$(I): GOSUB 21000
13610 DM$(I) = RS$: GOSUB 28000:V = V + 1: NEXT
13630 V = 17:H = 25:RS$ = CD$(6): GOSUB 21000:CD$(6) = RS$: GOSUB 28000
13640 V = 18:H = 15:RS$ = CD$(7): GOSUB 21000:CD$(7) = RS$: GOSUB 28000
13655 V = 19:H = 17:RS$ = CD$(8): GOSUB 21000:CD$(8) = RS$: GOSUB 28000
13670  GOSUB 26000: IF RS$ = "N" THEN 1030
13680  RETURN
13997  REM
13998  REM *** PRINT PAGE FOUR ***
13999  REM
14000  GOSUB 10000
14010  VTAB 4: PRINT "DIET : ";D7$( VAL (FD$(1)))
14015  IF PF = 1 AND FD$(1) = "11" THEN  VTAB 4: HTAB 8: CALL  - 868: VTAB
     4: HTAB 8: PRINT XD$(6)
14020  VTAB 5: PRINT "DIET TYPE : ";D8$( VAL (FD$(2)))
14030  VTAB 7: PRINT "FEED RATE : ";FD$(3)
14040  VTAB 8: PRINT " (% OF BODY WEIGHT) "
14050  VTAB 10: PRINT "FEEDING METHOD : ";D9$( VAL (FD$(4)))
14060  VTAB 12: PRINT "PELLET SIZE : ";FD$(5)
14070  RETURN
14497  REM
14498  REM *** INPUT PAGE FOUR ***
14499  REM
14500 MX = 11:V = 15: FOR I = 1 TO 5: VTAB V: HTAB 5: PRINT D7(I); SPC( 3
      -  LEN ( STR$ (D7(I))));D7$(I): VTAB V: HTAB 20: PRINT D7(I + 5); SPC(
     3 -  LEN ( STR$ (D7(I + 5))));D7$(I + 5):V = V + 1: NEXT
14510  VTAB V: HTAB 20: PRINT D7(11);" ";D7$(11)
14520 V = 4:H = 7:RS$ = FD$(1): GOSUB 21000: GOSUB 23000:FD$(1) = RS$:RS$
     = D7$( VAL (FD$(1))): GOSUB 28000
14522 RR$ = FD$(1):XC = 6: GOSUB 31000: GOSUB 28000
14530 V = 15:BL = 6:H = 5: GOSUB 27000
14540 V = 12:MX = 3: FOR I = 1 TO MX: VTAB V: HTAB 25: PRINT D8(I);" ";D8
     $(I):V = V + 1: NEXT
```

```
14550 V = 5:H = 12:RS$ = FD$(2): GOSUB 21000: GOSUB 23000:FD$(2) = RS$:RS
     $ = D8$( VAL (FD$(2))): GOSUB 28000
14560 V = 12:BL = MX:H = 25: GOSUB 27000
14570 V = 7:H = 12:RS$ = FD$(3): GOSUB 21000:FD$(3) = RS$: GOSUB 28000
14580 V = 12: FOR I = 1 TO MX: VTAB V: HTAB 25: PRINT D9(I);" ";D9$(I):V =
     V + 1: NEXT
14590 V = 10:H = 17:RS$ = FD$(4): GOSUB 21000: GOSUB 23000:FD$(4) = RS$:R
     S$ = D9$( VAL (FD$(4))): GOSUB 28000
14600 V = 12:H = 25:BL = MX: GOSUB 27000
14610 V = 12:H = 14:RS$ = FD$(5): GOSUB 21000:FD$(5) = RS$: GOSUB 28000
14620  GOSUB 26000: IF RS$ = "N" THEN 1040
14630  RETURN
14997  REM
14998  REM *** PRINT PAGE FIVE ***
14999  REM
15000  GOSUB 10000
15010  VTAB 4: HTAB 1: PRINT "BEHAVIOR : ";DA$( VAL (TM$(1)))
15015  IF PF = 1 AND TM$(1) = "10" THEN  VTAB 4: HTAB 12: CALL  - 868: VTAB
     4: HTAB 12: PRINT XD$(7)
15020  VTAB 6: PRINT "GROSS SIGNS : ";DB$( VAL (TM$(2)))
15025  IF PF = 1 AND TM$(2) = "14" THEN  VTAB 6: HTAB 15: CALL  - 868: VTAB
     6: HTAB 15: PRINT XD$(8)
15030  VTAB 8: PRINT "RECENT HANDLING : ";DC$( VAL (TM$(3)))
15040  VTAB 10: PRINT "PREVIOUS DIAGNOSIS : ";DV$(1)
15045  IF  LEN (DV$(1)) = 6 OR  LEFT$ (DV$(2),1) =  CHR$ (223) THEN  GOTO
     15055
15050  VTAB 11: HTAB 10: PRINT "(IF ANY)": GOTO 15060
15055  VTAB 11: PRINT "     DIAGNOSTICIAN : ";DV$(2)
15056  VTAB 12: PRINT "         DIAGNOSIS : ";DV$(6)
15060  VTAB 14: PRINT "PREVIOUS MEDICATION : ";DV$(3)
15065  IF  LEN (DV$(3)) = 6 OR  LEFT$ (DV$(4),1) =  CHR$ (223) THEN 15075

15070  VTAB 15: HTAB 10: PRINT "(IF ANY)"
15075  IF  LEN (DV$(3)) = 6 OR  LEFT$ (DV$(4),1) = "." THEN  VTAB 15: PRINT
     "                TYPE : ";DV$(4)
15080  VTAB 17: PRINT "VACCINATION : ";DV$(5)
15090  RETURN
15497  REM
15498  REM *** INPUT PAGE FIVE ***
15499  REM
15500 V = 18: FOR I = 1 TO 5: VTAB V: HTAB 5: PRINT DA(I); SPC( 3 -  LEN
     ( STR$ (DA(I)));DA$(I);: HTAB 25: PRINT DA(I + 5); SPC( 3 -  LEN ( STR$
     (DA(I + 5)));DA$(I + 5):V = V + 1: NEXT
15510 V = 4:H = 11:MX = 10:RS$ = TM$(1): GOSUB 21000: GOSUB 23000:TM$(1) =
     RS$:RS$ = DA$( VAL (TM$(1))): GOSUB 28000
15512 RR$ = TM$(1):XC = 7: GOSUB 31000: GOSUB 28000
15520 V = 17:BL = 6:H = 1: GOSUB 27000
15530 V = 16:BL = 1:H = 1: GOSUB 27000:V = 16: FOR I = 1 TO 7: VTAB V: HTAB
     1: PRINT DB(I); SPC( 3 -  LEN ( STR$ (DB(I)));DB$(I);: HTAB 24: PRINT
     DB(I + 7); SPC( 3 -  LEN ( STR$ (DB(I + 7)));DB$(I + 7):V = V + 1: NEXT

15540 V = 6:H = 14:MX = 14:RS$ = TM$(2): GOSUB 21000: GOSUB 23000:TM$(2) =
     RS$:RS$ = DB$( VAL (TM$(2))): GOSUB 28000
15542 RR$ = TM$(2):XC = 8: GOSUB 31000: GOSUB 28000
15550 V = 16:BL = 7:H = 1: GOSUB 27000: VTAB 17: PRINT "VACCINATION : ";D
     V$(5)
```

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15560 V = 19: FOR I = 1 TO 3: VTAB V: HTAB 8: PRINT DC(I); SPC( 3 - LEN
    ( STR$ (DC(I))));DC$(I);: HTAB 22: PRINT DC(I + 3); SPC( 3 - LEN ( STR$
    (DC(I + 3))));DC$(I + 3):V = V + 1: NEXT
15570 V = 8:H = 18:MX = 6:RS$ = TM$(3): GOSUB 21000: GOSUB 23000:TM$(3) =
    RS$:RS$ = DC$( VAL (TM$(3))): GOSUB 28000
15580 V = 19:BL = 3:H = 1: GOSUB 27000
15590 V = 19: FOR I = 1 TO 2: VTAB V: HTAB 20: PRINT DD(I); SPC( 3 - LEN
    ( STR$ (DD(I))));DD$(I):V = V + 1: NEXT
15592 V = 10:H = 21:MX = 2: IF LEN (DV$(1)) = 6 THEN MX = 999999
15594 RS$ = DV$(1): GOSUB 21000: GOSUB 23000:DV$(1) = RS$: IF RS$ = "1" THEN
    RS$ = "DDMMYY": GOSUB 28000: VTAB 11: PRINT "     DIAGNOSTICIAN : ";
    DV$(2): VTAB 12: PRINT "         DIAGNOSIS : ";DV$(6)
15596 IF RS$ = "2" THEN RS$ = "NO": GOSUB 28000:DV$(1) = RS$
15598 V = 19:BL = 2:H = 20: GOSUB 27000
15600 V = 10:H = 21: IF RS$ = "DDMMYY" THEN GOSUB 21000:B = 6: GOSUB 220
    00
15602 IF LEN (RS$) = 6 THEN GOSUB 25000:DV$(1) = RS$: GOSUB 28000:V =
    11:H = 21:RS$ = DV$(2): GOSUB 21000:DV$(2) = RS$: GOSUB 28000
15604 IF LEN (DV$(1)) = 6 THEN V = 12:H = 21:RS$ = DV$(6): GOSUB 21000:
    DV$(6) = RS$: GOSUB 28000
15620 V = 19: FOR I = 1 TO 2: VTAB V: HTAB 20: PRINT DD(I); SPC( 3 - LEN
    ( STR$ (DD(I))));DD$(I):V = V + 1: NEXT
15622 V = 14:H = 22:MX = 2: IF LEN (DV$(3)) = 6 THEN MX = 999999
15624 RS$ = DV$(3): GOSUB 21000: GOSUB 23000:DV$(3) = RS$: IF RS$ = "1" THEN
    RS$ = "DDMMYY": GOSUB 28000: VTAB 15: PRINT "              TYPE : "
    ;DV$(4)
15626 IF RS$ = "2" THEN RS$ = "NO": GOSUB 28000:DV$(3) = RS$
15628 V = 19:BL = 2:H = 20: GOSUB 27000
15630 V = 14:H = 22: IF RS$ = "DDMMYY" THEN GOSUB 21000:B = 6: GOSUB 220
    00
15632 IF LEN (RS$) = 6 THEN GOSUB 25000:DV$(3) = RS$: GOSUB 28000:V =
    15:H = 22:RS$ = DV$(4): GOSUB 21000:DV$(4) = RS$: GOSUB 28000
15666 V = 19: FOR I = 1 TO 2: VTAB V: HTAB 20: PRINT DD(I); SPC( 3 - LEN
    ( STR$ (DD(I))));DD$(I):V = V + 1: NEXT
15668 V = 17:H = 14:MX = 2: IF LEN (DV$(5)) = 6 THEN MX = 999999
15670 RS$ = DV$(5): GOSUB 21000: GOSUB 23000:DV$(5) = RS$: IF RS$ = "1" THEN
    RS$ = "DDMMYY": GOSUB 28000
15672 IF RS$ = "2" THEN RS$ = "NO": GOSUB 28000:DV$(5) = RS$
15674 V = 19:BL = 2:H = 20: GOSUB 27000
15676 V = 17:H = 14: IF RS$ = "DDMMYY" THEN GOSUB 21000:B = 6: GOSUB 220
    00
15678 IF LEN (RS$) = 6 THEN GOSUB 25000:DV$(5) = RS$: GOSUB 28000
15680 V = 19:BL = 2:H = 20: GOSUB 27000
15690 GOSUB 26000: IF RS$ = "N" THEN 1050
15700 RETURN
15997 REM
15998 REM *** PRINT PAGE SIX ***
15999 REM
16000 GOSUB 10000
16010 VTAB 4: PRINT "WATER SOURCE : ";DE$( VAL (W$(1)))
16020 VTAB 6: PRINT "SALINITY : ";W$(2)
16030 VTAB 8: PRINT "DISSOLVED OXYGEN :  IN : ";W$(3)
16040 VTAB 9: PRINT "                    OUT : ";W$(4)
16050 VTAB 11: PRINT "TGP : ";W$(5)
16060 VTAB 13: PRINT "HARDNESS : ";DF$( VAL (W$(6)))
16070 VTAB 15: PRINT "PH : ";W$(7)
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16080  VTAB 17: PRINT "NH3 : ";W$(8)
16090  RETURN
16497  REM
16498  REM *** INPUT PAGE SIX ***
16499  REM
16500 V = 19: FOR I = 1 TO 4: VTAB V: PRINT DE(I);" ";DE$(I);: IF I = 4 THEN
     16520
16510  HTAB 20: PRINT DE(I + 4);" ";DE$(I + 4):V = V + 1: NEXT
16520 MX = 7:V = 4:H = 15:RS$ = W$(1): GOSUB 21000: GOSUB 23000:W$(1) = R
     S$:RS$ = DE$( VAL (W$(1))): GOSUB 28000
16530 V = 19:H = 1:BL = 4: GOSUB 27000
16540 V = 6:H = 11:RS$ = W$(2): GOSUB 21000:W$(2) = RS$: GOSUB 28000
16550 V = 8:H = 25:RS$ = W$(3): GOSUB 21000:W$(3) = RS$: GOSUB 28000
16560 V = 9:H = 25:RS$ = W$(4): GOSUB 21000:W$(4) = RS$: GOSUB 28000
16570 V = 11:H = 6:RS$ = W$(5): GOSUB 21000:W$(5) = RS$: GOSUB 28000
16580 V = 19: FOR I = 1 TO 4: VTAB V: PRINT DF(I);" ";DF$(I);: IF I = 4 THEN
     16600
16590  HTAB 20: PRINT DF(I + 4);" ";DF$(I + 4):V = V + 1: NEXT
16600 MX = 7:V = 13:H = 11:RS$ = W$(6): GOSUB 21000: GOSUB 23000:W$(6) =
     RS$:RS$ = DF$( VAL (W$(6))): GOSUB 28000
16610 V = 19:H = 1:BL = 4: GOSUB 27000
16620 V = 15:H = 5:RS$ = W$(7): GOSUB 21000:W$(7) = RS$: GOSUB 28000
16630 V = 17:H = 6:RS$ = W$(8): GOSUB 21000:W$(8) = RS$: GOSUB 28000
16640  GOSUB 26000: IF RS$ = "N" THEN 1060
16650  RETURN
16999  REM
17000  REM *** INPUT COMMENTS ***
17001  REM
17010  GOSUB 10000
17020  PRINT : PRINT "ENTER ANY SPECIFIC COMMENTS YOU WISH TO": PRINT "MA
     KE REGARDING THIS REPORT"
17030  PRINT "PLEASE LIMIT SENTENCES TO LESS THAN 240": PRINT "CHARACTERS
      (APPROX. 6 LINES)"
17040  PRINT "WHEN FINISHED, TYPE <RETURN>": PRINT
17050 N = 0:V = 10:H = 1: FOR I = 1 TO 100:RS$ = CM$(I): PRINT " ";RS$: GOSUB
     21000: IF RS$ = "" THEN 17080
17060 CM$(I) = RS$:N = N + 1:V = V + 1 + ( LEN (RS$) / 40): IF V > 23 THEN
     V = 23
17070  NEXT
17080  GOSUB 26000: IF RS$ = "N" THEN 17000
17090  IF RS$ = "2" THEN RS$ = "NO": GOSUB 28000
17100  RETURN
20999  REM
21000  REM *** INPUT SUBROUTINE ***
21001  REM
21010  VTAB V: HTAB H: INPUT " ";A$: IF A$ = "" THEN  RETURN
21020  IF A$ =  CHR$ (16) THEN  PR# 1: PRINT  CHR$ (9);"S": PR# 0: GOTO 2
     1000
21022  IF A$ =  CHR$ (18) THEN  GOTO 140
21025  IF A$ = "/" THEN A$ = ""
21030 RS$ = A$
21040  RETURN
21999  REM
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```
22000  REM *** LENGTH CHECK ***
22001  REM
22010  IF  LEN (RS$) <  > B THEN  VTAB V: HTAB H: PRINT " DDMMYY  ": GOSUB
     21010: GOSUB 22010
22020  RETURN
22999  REM
23000  REM *** LIMITS CHECK ***
23001  REM
23010  IF A$ = "" THEN  RETURN
23015  IF  VAL (RS$) >  = MN THEN  IF  VAL (RS$) <  = MX THEN 23030
23020  PRINT TA$: GOSUB 21010: GOSUB 23010
23030  RETURN
23999  REM
24000  REM *** CHECK FOR CHAR. IN NUMBER STRING ***
24001  REM
24005  IF  LEN (RS$) = 0 THEN 24050
24010  FOR J = 1 TO  LEN (RS$): IF  VAL ( MID$ (RS$,J,1)) = 0 AND  MID$ (
     RS$,J,1) <  > "0" THEN 24040
24020  NEXT
24030  GOTO 24050
24040  PRINT TA$: GOSUB 21010: GOSUB 24010:
24050  RETURN
24999  REM
25000  REM *** DATE CHECK ***
25001  REM
25010  IF  VAL ( LEFT$ (RS$,2)) <  = 31 AND  VAL ( LEFT$ (RS$,2)) >  = 0 THEN
      GOTO 25030
25020  GOTO 25060
25030  IF  VAL ( MID$ (RS$,3,2)) <  = 12 AND  VAL ( MID$ (RS$,3,2)) >  =
     0 THEN 25050
25040  GOTO 25060
25050  IF  VAL ( RIGHT$ (RS$,2)) >  = 70 THEN 25070
25060  VTAB V: HTAB H: PRINT " DDMMYY  ": GOSUB 21000: GOSUB 25000
25070  RETURN
25999  REM
26000  REM *** OK SUBROUTINE ***
26001  REM
26010  VTAB 23: HTAB 28: PRINT "OK <Y/N>";:V = 23:H = 38: GOSUB 26020: RETURN

26020  VTAB V: HTAB H: GET RS$: IF RS$ <  > "Y" THEN  IF RS$ <  > "N" THEN
      VTAB V: GOTO 26020
26030  VTAB V: HTAB 1: CALL  - 868: VTAB 22: PRINT : RETURN
26999  REM
27000  REM *** BLANK OUT ROUTINE ***
27001  REM
27010  FOR I = 1 TO BL: VTAB V: HTAB H: CALL  - 868:V = V + 1: NEXT : RETURN

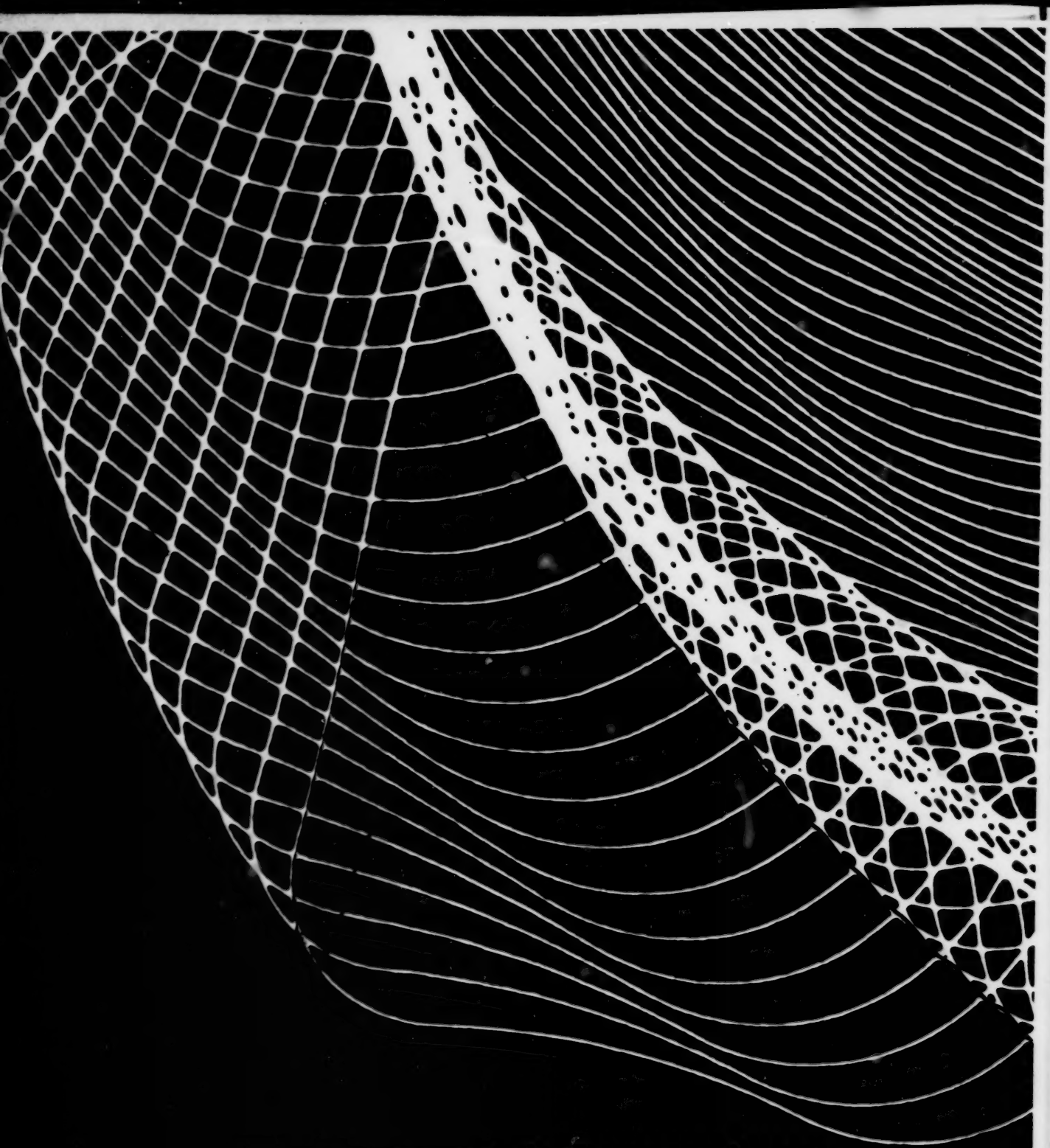
27999  REM
28000  REM *** PRINT DATA ROUTINE ***
28001  REM
28010  VTAB V: HTAB H + 1: PRINT RS$: RETURN
28997  REM
28998  REM *** WINDOWED INPUT SUBROUTINE***
```

```
28999  REM
29000  POKE 33,10: POKE 32,H: POKE 34,V - 1: POKE 35,V
29010  VTAB V: HTAB 1: INPUT "";A$: IF A$ = "" THEN  GOTO 29030
29012  IF A$ =  CHR$ (16) THEN  PR# 1: PRINT  CHR$ (9);"S": PR# 0: GOTO 2
     9010
29013  IF A$ =  CHR$ (18) THEN  GOTO 140
29014  IF A$ = "/" THEN A$ = ""
29016 RS$ = A$
29030  POKE 32,0: POKE 33,40: POKE 34,0: POKE 35,23
29040  VTAB V: HTAB H + 1: PRINT RS$
29050  RETURN
29997  REM
29998  REM *** DATA STATEMENTS ***
29999  REM
30000  REM *** D0$(I) = SPECIES ***
30010  DATA  1,COHO,2,CHINOOK,3,SUMMER CHINOOK,4,FALL CHINOOK,5,SOCKEYE,6
     ,CHUM,7,PINK,8,SUMMER STEELHEAD,9,WINTER STEELHEAD,10,DOLLY,11,RAINB
     OW,12,CUTTHROAT,13,OTHER
30020  REM *** D1$(I) = AGE ***
30030  DATA  1,EGGS,2,SAC FRY,3,FRY (BUTTONED),4,ADVANCED FRY,5,YEARLING,
     6,2 YEAR,7,3 YEAR,8,4 YEAR,9,IMMATURE ADULT,10,RIPE ADULT,11,SPENT A
     DULT,12,JACK,13,OTHER
30040  REM *** D2$(I) = SEX ***
30050  DATA  1,FEMALES,2,MALES,3,MIXED,4,UNKNOWN
30060  REM *** D3$(I) = SUBMISSION REASON ***
30070  DATA  1,HATCHERY LOSS,2,FISH KILL IN WILD,3,RESEARCH,4,HEALTH CHEC
     K,5,CERTIFICATION,6,OTHER
30080  REM *** D4$(I) = STOCK ORIGIN ***
30090  DATA  1,WILD,2,CULTURED,3,SEMI-WILD,4,UNKNOWN
30100  REM *** D5$(I) = SAMPLE TYPE ***
30110  DATA  1,LIVE,2,DEAD,3,MORIBUND,4,RANDOM,5,MIXED,6,OTHER
30120  REM *** D6$(I) = CONTAINER TYPES ***
30130  DATA  1,BURROWS,2,CIRCULAR,3,RACEWAY,4,NET PENS,5,KEEPER POND,6,TR
     OUGHS,7,CAP TROUGH,8,SPAWNING CHANNEL,9,EARTH POND,10,HEATH TRAY,11,
     GRAVEL BOX,12,NATURAL,13,OTHER
30140  REM *** D7$(I) = FOOD ***
30150  DATA  1,OMP,2,BIODIET,3,SIVERCUP,4,RANGERS,5,ABERNATHY,6,APEX,7,RE
     SEARCH,8,CUSLAN,9,NATURAL,10,NONE (STARVATION),11,OTHER
30160  REM *** D8$(I) = FOOD TYPE ***
30170  DATA  1,WET,2,DRY,3,MIXED
30180  REM *** D9$(I) = FEEDING METHOD ***
30190  DATA  1,HAND ,2,MACHINE,3,NATURAL
30200  REM *** DA$(I) = BEHAVIOR ***
30210  DATA  1,NORMAL,2,NOT FEEDING,3,ON SURFACE,4,ON OUTLET,5,SLUGGISH,6
     ,MORIBUND,7,DEAD,8,FLASHING,9,CORKSCREWING,10,OTHER
30220  REM *** DB$(I) = GROSS SYMPTOMS ***
30230  DATA       1,NORMAL,2,DARK,3,POPEYED,4,OPEN LESIONS,5,BLUE COLOUR (
     SPOTS),6,SCALE LOSS,7,HEMORRHAGING,8,FIN ROT,9,FIN EROSIONS,10,RED V
     ENT,11,RED MOUTH,12,PARASITES,13,FUNGUS,14,OTHER
30240  REM *** DC$(I) = HANDLING ***
30250  DATA   1,SORTING,2,TAGGING,3,SAMPLING,4,MOVING,5,GRADING,6,RESEARC
     H
30260  REM *** DD$(I) = VACCINATIONS ***
```

```
30270  DATA   1,YES (& DATE DONE),2,NO
30280  REM *** DE$(I) = WATER SOURCE ***
30290  DATA  1,SURFACE,2,WELL,3,RIVER,4,CITY,5,LAKE,6,SALT,7,BRACKISH
30300  REM *** DF$(I) = WATER HARDNESS ***
30310  DATA  1,EXTREMELY SOFT,2,VERY SOFT,3,SOFT,4,MODERATE,5,HARD,6,VERY
     HARD,7,EXTREMELY HARD
30320  REM *** MAIN MENU DATA ***
30330  DATA  7,1,INPUT FOR REPORT,8,2,REVIEW OF REPORT,9,3,HARD COPY OF R
    EPORT,11,4,STORE DATA ON DISK,12,5,RECALL DATA FROM DISK,14,6,HARDCO
    PY OF BLANK FORM
30340  DATA   16,7,RETURN TO FISH HEALTH
30350  REM *** FORM LABELS ***
30360  DATA 12,5,5,1,1,5,5,1,1,9,1,9,1,1,6,12
30365  DATA  12,7,5,6,6,6,6,6,6,1,11,11,9,6,6,5,15,13,6,5,6,2,2,11,1,12,1
    1
30370  DATA 8,12,12,2,10,8,5,15,10,5,15,12,8,5,1,5
30999  REM
31000  REM *** INPUT "OTHER" DATA SUBROUTINE ***
31001  REM
31002 J = 0
31020 CF(1) = 13:CF(2) = 13:CF(3) = 6:CF(4) = 6:CF(5) = 13:CF(6) = 11:CF(
    7) = 10:CF(8) = 14
31030  IF A$ = "" AND  VAL (RR$) = CF(XC) THEN  VTAB V: HTAB H: CALL  - 8
    68:RS$ = XD$(XC): RETURN
31040  IF  VAL (RR$) <  > CF(XC) THEN  RETURN
31045 PF = 1
31050  VTAB V: HTAB H + 1: CALL  - 868
31060  VTAB 23: CALL  - 868: VTAB 23: HTAB 5: PRINT "USE SEMICOLONS,";: INVERSE : VTAB 23:
31061  IF XC = 2 THEN  VTAB 12: HTAB 24: PRINT "2  SAC FRY"
31070  VTAB V: HTAB H + 1: INPUT "";XD$(XC)
31075  VTAB 23: HTAB 5: CALL  - 868
31080  FOR I = 1 TO  LEN (XD$(XC))
31090 RT$ =  MID$ (XD$(XC),I,1)
31095 RU$ = ""
31100  IF I <  LEN (XD$(XC)) THEN RU$ =  MID$ (XD$(XC),I + 1,1)
31110  IF  VAL (RT$) <  > 0 OR RT$ = "0" THEN J = J + 1:SS$(J) = RT$: IF
     VAL (RU$) <  > 0 OR RU$ = "0" THEN SS$(J) = SS$(J) + RU$:I = I + 1
31120  NEXT
31140  IF J = 0 THEN XFLAG = 1:RS$ = XD$(XC): RETURN
31150 RS$ = ""
31160  ON XC GOTO 31200,31210,31220,31230,31240,31250,31260,31270
31200  FOR I = 1 TO J:SS(I) =  VAL (SS$(I)):RS$ = RS$ + D0$(SS(I)) + "; "
    : NEXT : GOTO 31300
31210  FOR I = 1 TO J:SS(I) =  VAL (SS$(I)):RS$ = RS$ + D1$(SS(I)) + "; "
    : NEXT : GOTO 31300
31220  FOR I = 1 TO J:SS(I) =  VAL (SS$(I)):RS$ = RS$ + D3$(SS(I)) + "; "
    : NEXT : GOTO 31300
31230  FOR I = 1 TO J:SS(I) =  VAL (SS$(I)):RS$ = RS$ + D5$(SS(I)) + "; "
    : NEXT : GOTO 31300
31240  FOR I = 1 TO J:SS(I) =  VAL (SS$(I)):RS$ = RS$ + D6$(SS(I)) + "; "
    : NEXT : GOTO 31300
31250  FOR I = 1 TO J:SS(I) =  VAL (SS$(I)):RS$ = RS$ + D7$(SS(I)) + "; "
    : NEXT : GOTO 31300
31260  FOR I = 1 TO J:SS(I) =  VAL (SS$(I)):RS$ = RS$ + DA$(SS(I)) + "; "
    : NEXT : GOTO 31300
```

```
31270  FOR I = 1 TO J:SS(I) =  VAL (SS$(I)):RS$ = RS$ + DB$(SS(I)) + "; "
     : NEXT : GOTO 31300
31300 I =  LEN (RS$):RS$ =  LEFT$ (RS$,I - 2):XD$(XC) = RS$:XFLAG = 1: RETURN

32030  IF A$ = "" AND  VAL (RR$) = CF(XC) THEN  VTAB V: HTAB H: CALL  - 8
     68:RS$ = XD$(XC): RETURN
```



Traitement informatique
...s problèmes de pathologie du
... dans les piscifactures

G.E. Hoskins • C.J. West • A.E. Kling

Publication spéciale canadienne des sciences halieutiques et aquatiques 68

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Traduction : D. CAMPILLO-CERF

Traitement informatique des problèmes de pathologie du poisson dans les piscifactures

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Table des matières

	Page
Résumé/Abstract	iv
Introduction	1
Description des programmes	1
Notes d'introduction	2
Anesthésiques	3
Informations sur les produits chimiques	3
Désinfectants	3
Rapport de cas	3
Traitement des maladies	4
Matériel et diffusion du programme	5
Remerciements	5
Annexe Ia. Imprimé du rapport de cas	6
Annexe Ib. Traduction de l'imprimé du rapport de cas	10
Annexe II. Matrice des programmes	14
Annexe III. Mode d'administration et dosage recommandé pour chaque traitement	17
Annexe IV. Imprimé des sous-programmes	19
Santé des poissons (Fish Health)	19
Rapport de cas (Case Reporter)	33

Résumé

HOSKINS, G.E., C.J. WEST ET A.E. KLING, 1984. Traitement informatique des problèmes de pathologie du poisson dans les piscifactures, *Publ. spéc. can. sci. halieut. aquat.* 68 : 46 p.

La présente publication spéciale contient une description d'un programme machine conçu dans le but d'aider les pisciculteurs à contrôler et à traiter les maladies dans les établissements d'élevage, surtout les maladies des saumons du Pacifique. Une fois une maladie infectieuse diagnostiquée par un spécialiste de la santé des poissons, le programme aidera à choisir le traitement approprié, fera tous les calculs nécessaires et décrira la méthode d'application. On décrit un sous-programme qui aidera le personnel des établissements de pisciculture à enregistrer l'occurrence des problèmes sanitaires des poissons. Le programme est présenté dans la version « Applesoft » du BASIC ; on peut se procurer des copies, pour une période limitée, sur disquettes de 5¼ po.

Abstract

HOSKINS, G.E., C.J. WEST ET A.E. KLING, 1984. Traitement informatique des problèmes de pathologie du poisson dans les piscifactures, *Publ. spéc. can. sci. halieut. aquat.* 68 : 46 p.

A computer program designed to assist fish culturists with the control and treatment of hatchery diseases, especially diseases of Pacific salmon, is described. Following diagnosis of an infectious disease by a fish health specialist, the program will assist in selection of the appropriate treatment procedure, perform all of the necessary calculations, and outline the method of application. A subprogram designed to assist hatchery personnel in recording the occurrence of fish health problems is also described. The program is written in the "Applesoft" version of the BASIC language; 5¼–inch floppy disk copies are available for a limited period.

Introduction

Dans les installations de pisciculture où sont élevés des millions d'animaux, la lutte contre les maladies infectieuses est une préoccupation majeure. Cette lutte est toutefois entravée par des problèmes que suscite la nature même de l'établissement : surpeuplement, manutention, marquage et transport ; la combinaison de ces facteurs produit chez les poissons des stress qui les rendent vulnérables à une vaste gamme d'agents d'infection. La situation se complique du fait que les organismes pathogènes peuvent se répandre avec rapidité et facilité dans le milieu aquatique. Toutefois, pour être efficace, la lutte contre les maladies doit faire partie intégrante du fonctionnement d'une piscifacture.

En Colombie-Britannique, le ministère fédéral des Pêches et des Océans s'occupe de plus de 35 installations qui pratiquent l'élevage intensif des salmonidés, et principalement des saumons du Pacifique (*Oncorhynchus* spp.). Dans les conditions de production intensive nécessaires, la lutte contre les maladies est essentielle au succès de cette activité. De nombreux facteurs influent sur les diverses approches qui peuvent être utilisées dans la lutte contre les maladies. Par exemple, dans cette province, des facteurs comme les espèces, l'alimentation, la qualité de l'eau, la conception de la piscifacture et la densité dans les bassins varient considérablement d'un établissement à l'autre. Élément plus important encore, les conditions d'élevage se modifient fréquemment pour suivre l'évolution des stratégies et des politiques de gestion des pêches. Il en résulte que les tableaux standard d'application des traitements chimiques en cas d'épizootie ne sont pas très satisfaisants. Étant donné les modifications rapides des conditions, chaque traitement doit faire l'objet de calculs spéciaux et de méthodes d'application particulières.

L'emploi de produits chimiques en pisciculture est par ailleurs inévitable. Selon de récentes découvertes du service de diagnostic de la Station de biologie du Pacifique à Nanaimo (C.-B.), il existe à l'état naturel dans la province de nombreux agents d'infection qui sont largement répandus. Dans la plupart des installations, il n'est ni possible ni faisable d'éviter la présence de ces agents pathogènes. Les pisciculteurs doivent plutôt faire appel à des techniques de gestion qui maximisent la santé du poisson en minimisant le stress qui favorise l'apparition des maladies. Toutefois, lorsque ces techniques échouent ou ne sont pas applicables, il devient nécessaire d'employer des traitements prophylactiques ou, pire encore, d'avoir à lutter contre une épizootie.

Par ailleurs, l'emploi des produits chimiques, des médicaments et des antibiotiques recommandés par la littérature peut provoquer des pertes supplémentaires si ces substances ne sont pas administrées correctement à des dosages correspondant aux conditions locales. De nombreux traitements chimiques ont été mis au point pour les eaux dures des États-Unis ou d'Europe et visent la truite domestique, la carpe ou d'autres espèces qui souvent ne sont pas indigènes à la province. L'expérience a montré que, dans l'eau douce de la côte de Colombie-Britannique, les salmonidés sont très vulnérables aux effets toxiques de nombreux agents chimiothérapiques, particulièrement lorsque les poissons sont déjà affaiblis par une maladie infectieuse.

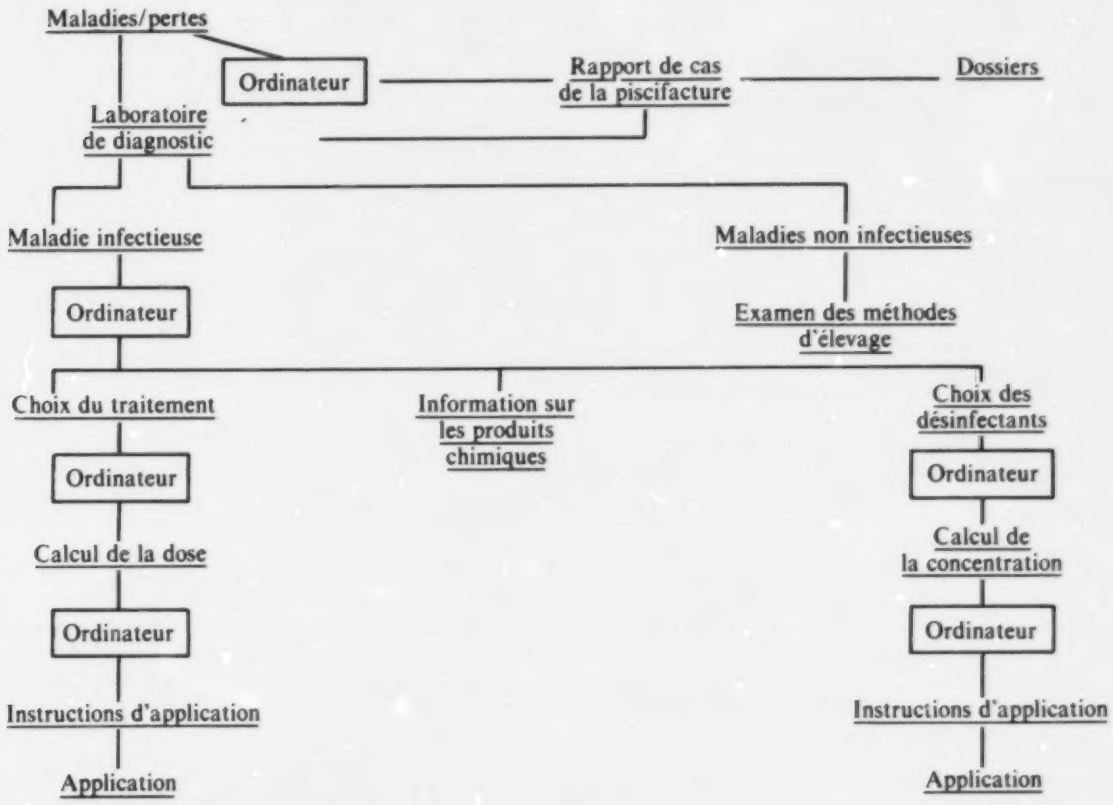
Le problème principal qui se pose dans de nombreuses installations est probablement la difficulté qu'il y a à administrer un agent chimiothérapique dans un bassin contenant des centaines de milliers ou même, dans certains cas, des millions de poissons. Cette difficulté est due autant à l'absence de standardisation de la conception des bassins qu'à la nécessité de modifier fréquemment les méthodes d'élevage. En conséquence, le pisciculteur se trouve confronté à un fatras de procédures, de produits chimiques équivalents, de dosages, de concentrations, dans des conditions environnementales variables. De plus, il doit parfaitement connaître les effets physiologiques du produit chimique employé. Par exemple, l'utilisation de Diquat chez les smolts peut détruire leur aptitude à s'adapter à l'eau de mer. De plus, les calculs doivent être exacts sous peine de désastre.

Afin de régler bon nombre de ces problèmes, la présente publication expose deux programmes informatiques étroitement liés, conçus spécialement pour aider le salmoniculteur de Colombie-Britannique à résoudre ses problèmes pathologiques et présentant les mesures à prendre. Les programmes offrent avec un haut degré de standardisation une approche systématique et calculable de la prévention et de la lutte contre les maladies. De plus, ils se sont révélés un outil intéressant pour la formation du personnel des piscifactures et des étudiants dans ce domaine. Ils sont conçus principalement pour les installations d'élevage du saumon du Pacifique en Colombie-Britannique et non pour les piscifactures qui font du poisson de consommation, et où le poisson pourrait être prélevé moins de un mois après le traitement. Ces deux programmes peuvent toutefois être modifiés et appliqués à d'autres espèces et types d'établissements. Étant donné que, combinés, ils constituent un programme idéal de traitement des maladies du poisson, ils seront considérés comme un seul programme dans le cadre du présent document. Ces deux programmes sont rédigés dans la version Applesoft du langage BASIC et sont destinés au microordinateur Apple II de 48 K. En Colombie-Britannique, la plupart des pisciculteurs et des biologistes du gouvernement fédéral ont directement accès à cet ordinateur.

Description des programmes

Les deux programmes s'intitulent « Case Reporter » (rapport de cas) et « Fish Health » (santé des poissons). En combinaison, ils remplissent quatre fonctions primaires : 1) aider le pisciculteur à choisir le traitement, l'anesthésique ou le désinfectant nécessaires ; 2) effectuer les calculs nécessaires ; 3) aider à rassembler de l'information sur les problèmes de maladie d'une pisciculture ; enfin, 4) donner de l'information sur la manutention, l'entreposage et l'emploi des divers agents chimiothérapiques. Les domaines où ce système peut jouer un rôle efficace sont illustrés par l'organigramme du tableau 1. Pour des raisons de facilité d'emploi, les

TABLEAU I — Organigramme montrant les secteurs où le programme s'applique à la santé des poissons.



programmes sont structurés en un menu simple à six sections :

1. Notes d'introduction
2. Anesthésiques
3. Informations sur les produits chimiques
4. Désinfectants
5. Rapport de cas
6. Traitement des maladies

Chacune de ces sections est exposée en détail ci-dessous. Dans la plupart des cas, il suffit de passer une ou deux fois chaque section du menu pour connaître suffisamment bien le système et l'utiliser efficacement.

Notes d'introduction

Il s'agit pour l'essentiel d'une brève introduction au programme qui expose son objet et signale les touches du clavier qui ont une fonction spéciale. Le fonctionnement est simple ; toutes les entrées incorrectes sont ignorées, et la touche « CTRL » (contrôle) peut être utilisée lorsqu'apparaît sur l'écran vidéo l'une des inscriptions suivantes :

1. OK (Y/N) ?
2. SELECT ?
3. (PRESS ANY KEY TO CONTINUE)
4. STANDARD DOSE OK ?
5. AI'S OK ?

En appuyant simultanément sur les touches « CTRL » et « R », l'opérateur peut retourner au menu à n'importe quel point des programmes. S'il dispose d'une imprimante, il peut faire imprimer n'importe quel affichage en appuyant simultanément sur les touches « CTRL » et « P ». On peut modifier toute entrée au clavier en inscrivant « N » lorsqu'apparaît OK(Y/N) ?, ce qui fait réapparaître la dernière série de questions. Lorsqu'apparaît la formule STANDARD DOSE OK ?, il est possible de modifier le dosage en fonction des besoins particuliers ; dans le cas contraire, la machine utilise un dosage standard pré-programmé. Lorsqu'apparaît AI'S OK ?, il est possible de modifier la quantité d'ingrédient actif (AI) en fonction du produit qui a été retenu.

Anesthésiques

Bien que cette section ne soit pas directement en rapport avec les maladies, elle a été retenue pour son utilité. Elle accomplit tous les calculs nécessaires pour préparer des bains anesthésiques permettant d'immobiliser les poissons. Elle fait appel à trois anesthésiques couramment employés, le dioxyde de carbone, le MS222 et le 2-phénoxyéthanol ; il est possible d'en ajouter d'autres le cas échéant. Nous avons retenu le dioxyde de carbone car les règles d'exploitation des piscifactures interdisent l'emploi d'autres produits chimiques sur des poissons destinés à la consommation humaine immédiate. Si l'on désire prélever des échantillons morts, et que les poissons ne sont pas destinés à la consommation humaine, on peut calculer la quantité de MS222 nécessaire pour tuer le poisson rapidement.

L'emploi de cette section est simple, et il n'est pas nécessaire d'en préciser les détails. Après le choix de l'un des anesthésiques, l'utilisateur est prié d'indiquer soit la forme et les dimensions du bassin, soit son volume. Tant pour le volume que pour les dimensions, on peut choisir entre cinq unités différentes de mesure. Lorsque la quantité d'ingrédient actif du produit utilisé est confirmée, le programme calcule la quantité nécessaire et résume la préparation du bain. Le programme ne peut tenir compte de toutes les variables qui peuvent influer sur le degré réel d'immobilisation ; il est donc conseillé de toujours tester le bain avec un petit lot de poissons.

Informations sur les produits chimiques

Il s'agit pour l'essentiel d'une liste d'informations sur les produits chimiques qui sont utilisés dans le programme. La section est avant tout un guide pour l'entreposage, la manutention et la toxicité, mais elle peut comporter d'autres informations. Nous avons retenu un produit et recommandé son emploi en fonction des critères suivants :

1. absence relative de toxicité pour le poisson en eau douce ;
2. absence relative de toxicité pour les humains et faible danger pour l'environnement ;
3. efficacité ;
4. disponibilité et faible coût.

Tous les médicaments, qu'il s'agisse d'hormones, d'anesthésiques, d'antibiotiques ou autres, doivent être administrés avec précaution et dans un but bien précis. L'approche d'autrefois et le dosage au jugé ne sont plus acceptables dans les installations d'aujourd'hui, qui sont conçues pour une production intensive et une haute technologie. De plus, il faut toujours considérer les incidences que peuvent avoir sur l'environnement les substances utilisées. Le programme impose certaines mesures de précaution : par exemple, il interdit l'emploi de formol dans des eaux à température élevée. Il signale l'emploi d'Hyamine et de Roccal, mais recommande de limiter leur utilisation à la désinfection du matériel.

Désinfectants

Comme le savent tous les pisciculteurs, l'utilisation efficace des désinfectants constitue un élément clé dans la lutte contre les maladies infectieuses. Le programme peut les aider à éviter les solutions de désinfectant trop faibles ou trop concentrées qui seront soit totalement inefficaces soit corrosives pour le matériel. L'utilisateur peut choisir dans cette section parmi sept produits d'emploi général et offerts dans le commerce. Pour calculer la concentration de la solution, il emploie le même segment de programme que pour les anesthésiques. Les questions posées et les affichages sur l'écran sont semblables pour ces deux parties.

Il faut signaler que l'une des méthodes les plus sûres et les plus efficaces de désinfection consiste à rincer les filets et les ustensiles dans de l'eau propre et non polluée et à les laisser sécher au soleil.

Si le pisciculteur a besoin d'une désinfection immédiate, le programme lui indique deux sources de chlore : HTH (hypochlorite de calcium) et eau de javel domestique. L'utilisation du chlore s'accompagne d'instructions spéciales. Étant donné sa nature corrosive et sa forte toxicité pour le poisson, la manutention et l'élimination de ce produit demandent des précautions particulières. Toutes les solutions de chlore doivent être neutralisées au thiosulfate de sodium avant élimination.

Cette section est facile à suivre et ne demande pas d'instructions spéciales. Tout comme pour la plus grande partie du programme, quelques minutes suffiront à familiariser le personnel d'une piscifacture avec son emploi.

Rapport de cas

Il est nécessaire de disposer de rapports exacts sur les conditions qui prévalent dans une piscifacture, sur le comportement du poisson et sur les symptômes apparents pour déterminer la cause première des problèmes de maladie du poisson. Bien souvent, cette information peut donner des indications utiles sur les méthodes d'examen à suivre. Dans certains cas, le comportement du poisson et les symptômes apparents permettent d'établir un diagnostic ; par exemple, la mort avec écartement des opercules indique probablement une grave irritation des branchies ou une forte carence en oxygène, alors qu'un excès de mucus sur les branchies peut indiquer un pH trop bas de l'eau ou un empoisonnement par le cyanure. Des données comme la structure de la mortalité, même sur de courtes périodes, peuvent révéler quel est le type d'agent responsable : parasite, maladie de la nutrition, bactérie, virus ou problème environnemental.

La section utilise seulement le sous-programme « Case Reporter » et est indépendante du reste du programme. Sa fonction principale consiste à aider les employés de la piscifacture à enregistrer les événements et les conditions qui entourent un problème de maladie. Dans un cas de ce type, il est souhaitable de tenir à jour des dossiers complets. Une fois le rapport terminé, il est possible de l'imprimer pour l'envoyer avec les échantillons de poisson au laboratoire de diagnostic et pour le

verser dans les dossiers de la piscifacture. L'annexe I présente ce rapport en blanc afin d'illustrer le type d'information qui a le plus d'intérêt lorsqu'on veut déterminer la cause d'un problème.

Ce sous-programme est géré par un menu en huit points :

1. Entrée du rapport
   pose à l'utilisateur une série de questions lui permettant d'établir un rapport de cas complet
2. Revue du rapport
   permet d'examiner le rapport terminé afin d'y rechercher les erreurs et les omissions et d'y apporter des corrections avant impression ou enregistrement
3. Rapport imprimé
   produit sur papier le rapport terminé lorsque l'utilisateur possède une imprimante
4. Enregistrement du rapport
   enregistre le rapport terminé sur disquette
5. Rappel du rapport sur disquette
   permet de rappeler par son nom tout rapport enregistré sur disquette
6. Retour au menu des maladies
   retourne au menu principal de traitement des maladies
7. Impression du formulaire en blanc
   fait imprimer une copie en blanc du rapport qui pourra être utilisé sans passer par l'ordinateur
8. Retour au menu utilitaire
   retourne au menu utilitaire qui donne la liste de tous les programmes de gestion de la piscifacture qui sont enregistrés sur la disquette.

Les rapports de cas préparés avec l'aide du sous-programme se présentent sous une forme qu'il est facile de remettre en machine pour l'analyser et la manipuler. Le responsable de la piscifacture peut utiliser les données enregistrées sur un disque souple soit pour établir des rapports mensuels soit pour surveiller l'évolution de l'apparition des maladies dans son établissement. Des modifications mineures dans les méthodes d'élevage et de manipulation peuvent avoir des conséquences importantes sur la santé des poissons. Pour analyser les relations de cause à effet, il est essentiel de disposer de rapports complets sur chaque cas ; le sous-programme, qui pose des questions à l'utilisateur, lui permet de s'assurer qu'il dispose d'informations complètes.

L'emploi du programme est simple. L'utilisateur doit répondre à une série de trois ou quatre questions ; lorsqu'il y a répondu, une autre série apparaît sur le moniteur. Afin de limiter l'utilisation du clavier, une liste de réponses apparaît aussi souvent que possible, et l'utilisateur n'a qu'à inscrire le numéro correspondant à la réponse. Pour les données essentielles, comme la date et le lieu, le programme ne se poursuit pas tant que l'information n'a pas été fournie. Par contre, on peut ignorer les autres questions en appuyant sur la touche « RETURN ». Lorsqu'il est rempli, le rapport doit être enregistré de façon permanente sur une disquette.

Traitement des maladies

Outre qu'il effectue tous les calculs, ce segment du programme est conçu pour aider le pisciculteur à choisir toutes les mesures de lutte contre les maladies et de prévention. Il est efficace surtout lorsqu'on dispose d'un diagnostic exact, établi aussitôt que possible après l'apparition des premiers signes de problèmes. Le facteur temps est particulièrement important en cas de maladies infectieuses aiguës. La furonculose, par exemple, réagit d'autant mieux à la Terramycin que l'antibiotique est administré tôt, avant que les pertes ne soient trop élevées et que les poissons aient cessé de s'alimenter. Toutefois, il ne faut pas entreprendre de traitement sans avoir une raison précise ou un diagnostic bien établi. De plus, il ne faut utiliser de traitement prophylactique que lorsqu'on connaît la présence d'un agent pathogène.

L'emploi de la section est simple. Les 24 maladies infectieuses les plus répandues en Colombie-Britannique sont énumérées sous forme de menu. Après en avoir choisi une, l'utilisateur est prié d'inscrire l'âge du poisson, d'indiquer s'il veut faire de la prévention ou du traitement et, dans certains cas, de signaler la température de l'eau. En fonction des réponses de l'utilisateur, la machine fait apparaître une liste de un à quatre traitements qui donne la première place à celui qui est recommandé. Dans le cas des antibiotiques, on pose pour hypothèse que le diagnosticien a informé le pisciculteur de la sensibilité au produit de l'agent bactérien.

La matrice sur laquelle se fonde le choix du traitement est indiquée à l'annexe II. Il est intéressant de s'y reporter pour mieux comprendre l'organisation du programme et les éléments dont il tient compte dans le choix du traitement. Les dosages enregistrés dans la matrice sont indiqués à l'annexe III. Les personnes qui n'ont pas accès à un microordinateur Apple trouveront ces deux annexes très utiles pour l'établissement de leur propre traitement.

Lorsque l'ordinateur et l'utilisateur ont choisi un traitement, la machine présente son mode d'application avec des précautions importantes d'emploi et autres conseils. L'utilisateur est alors prié de donner l'information suffisante pour calculer le dosage nécessaire. Dans tous les cas, il s'agit de doses et de temps de traitement standard, à moins d'intervention de l'utilisateur.

Les diverses méthodes de traitement proposées sont les suivantes :

immersion	exposition de 1 à 10 minutes à des concentrations assez fortes de produits chimiques
bain statique	exposition de une heure à une concentration modérée de produits chimiques
lavage	passage unique et rapide d'un jet de produits chimiques à des concentrations diverses
long bain	exposition pour de longues périodes à de faibles concentrations de produits
oral	administration dans la nourriture
injection	application par injection des substances dans le sinus dorsal

vaccin	normalement, immersion rapide dans du vaccin dilué selon les instructions du fabricant.

Le choix des produits se fonde tout d'abord sur le diagnostic, l'âge des poissons, et le choix entre le traitement ou la prévention. La matrice ne comporte aucun produit chimique dont on ne connaît pas bien l'effet sur les poissons ou qui n'affecte pas tous les salmonidés de la même manière et au même degré. Le produit final est un résumé sur écran de toutes les entrées et une procédure de base pour la préparation des solutions-mères nécessaires, l'établissement de la vitesse de pompage, etc., qui peuvent être imprimés pour être versés au dossier de la piscifacture et présentés aux superviseurs.

Les utilisateurs du programme sont prévenus que l'introduction des solutions-mères dans les bassins où le taux d'échange est faible peut ne pas produire les concentrations et les temps d'exposition recherchés. Dans ce cas, avant d'introduire la solution-mère, il est bon d'amener le bassin à la concentration recherchée à l'aide des méthodes du bain statique. Il est aussi conseillé de terminer le traitement en abaissant rapidement le niveau de l'eau et en remplissant de nouveau avec de l'eau exempte de produits chimiques.

Par ailleurs, il est signalé aux utilisateurs que le débit d'entrée et la vitesse de la pompe qui introduit le produit chimique doivent être compatibles ; dans le cas contraire, les concentrations recommandées par le programme pour les solutions-mères ne pourront pas être atteintes.

Matériel et diffusion du programme

Pour ce qui est du matériel, il est nécessaire de posséder un système relativement puissant. Bien que, comme nous l'avons signalé, le programme ait été conçu pour le microordinateur Apple II Plus, un programmeur connaissant bien le langage BASIC devrait être capable de l'adapter sans grande difficulté à d'autres systèmes. Il est bon de disposer du matériel suivant :

- microordinateur, 48 K de mémoire
- deux lecteurs de disquette
- moniteur avec écran antiréfléchissant vert
- imprimante
- bloc numérique.

À l'intention des personnes qui désirent examiner la structure et l'organisation du programme ou l'adapter à une autre machine, les sous-programmes sont présentés sur papier à l'annexe IV.

Le programme est aussi offert sur disquette de 5¼ po destiné au microordinateur Apple 48 K. Commander les disques au Centre d'édition du gouvernement du Canada, Ottawa, Canada K1A 0S9 (Canada 40 $, autres pays 48 $).

Les auteurs seront heureux de recevoir tout commentaire ou suggestion d'amélioration, ou de voir signalée toute erreur dans le programme.

La mention dans la présente publication des noms commerciaux qui suivent ne signifie pas nécessairement que les auteurs recommandent l'emploi de ces produits.

Nom	Ingrédient actif
Betadine	povidone-iode
Diquat	herbicide chimique
Furanace	nifurpirinol
Gallimycin	érythromycine
HTH	hypochlorite de calcium
Hyamine	chlorure de benzalkonium
MS222	tricaïne
Ovadine	povidone-iode
Roccal	chlorure de benzalkonium
Terramycin	oxytétracycline
Wescodyne	povidone-iode

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Annexe Ia. Imprimé du rapport de cas

CASE REPORTER

DATE: _____
SAMPLE SITE: _____
CONTRIBUTOR: _____
SPECIES: * _____
AGE: * _____
LENGTH (MM): _____
WEIGHT (GM): _____
SEX: * _____

REASON FOR SUBMISSION: * _____
DATE COLLECTED: _____
STOCK ORIGIN: * _____

		LOSSES	WATER TEMP °C
TODAY'S	(7)	_____	_____
PAST WEEK	(6)	_____	_____
	(5)	_____	_____
	(4)	_____	_____
	(3)	_____	_____
	(2)	_____	_____
	(1)	_____	_____

SPECIES OPTIONS

COHO
CHINOOK
SUMMER CHINOOK
FALL CHINOOK
SOCKEYE
CHUM
PINK
SUMMER STEELHEAD
WINTER STEELHEAD
DOLLY
RAINBOW
CUTTHROAT
OTHER

AGE OPTIONS

EGGS
SAC FRY
FRY (BUTTONED)
ADVANCED FRY
YEARLING
2 YEAR
3 YEAR
4 YEAR
IMMATURE ADULT
RIPE ADULT
SPENT ADULT
JACK
OTHER

SEX OPTIONS

FEMALES
MALES
MIXED
UNKNOWN

SUBMISSION REASONS

HATCHERY LOSS
FISH KILL IN WILD
RESEARCH
HEALTH CHECK
CERTIFICATION
OTHER

STOCK ORIGIN

WILD
CULTURED
SEMI-WILD
UNKNOWN

CASE REPORTER

SAMPLE SIZE: _____
SAMPLE TYPE: * _____
NO. AFFECTED CONTAINERS: _____
CONTAINER I.D.: _____
CONTAINER TYPE: * _____
SIZE WIDTH: _____
LENGTH: _____
DEPTH: _____
DIAMETER: _____
UNKNOWN: _____
LOAD (FISH/CONTAINER): _____
POND INFLOW: _____
POND VELOCITY: _____

DIET: * _____
DIET TYPE: * _____
FEED RATE: _____
(% OF BODY WEIGHT)
FEEDING METHOD: * _____
PELLET SIZE: _____

SAMPLE TYPE	CONTAINER TYPE
LIVE	BURROWS
DEAD	CIRCULAR
MORIBUND	RACEWAY
RANDOM	NET PENS
MIXED	KEEPER POND
OTHER	TROUGHS
	CAP TROUGH
	SPAWNING CHANNEL
	EARTH POND
	HEATH TRAY
	GRAVEL BOX
	NATURAL
	OTHER

DIET	DIET TYPE	FEEDING METHOD
OMP	WET	HAND
BIODIET	DRY	MACHINE
SIVERCUP	MIXED	NATURAL
RANGERS		
ABERNATHY		
APEX		
RESEARCH		
CUSLAN		
NATURAL		
NONE (STARVATION)		
OTHER		

CASE REPORTER

BEHAVIOR: * _____
GROSS SIGNS: * _____
RECENT HANDLING: * _____
PREVIOUS DIAGNOSIS: _____
DIAGNOSTICIAN: _____
DIAGNOSIS: _____
PREVIOUS MEDICATION : _____
VACCINATION: _____

FOR PREVIOUS DIAGNOSIS, PREVIOUS MEDICATION AND VACCINATION FILL IN DATES IF DONE

WATER SOURCE: * _____
SALINITY: _____
DISSOLVED OXYGEN: IN: _____
OUT: _____
TGP: _____
HARDNESS: * _____
PH: _____
NH3: _____

BEHAVIOR

NORMAL
NOT FEEDING
ON SURFACE
ON OUTLET
SLUGGISH
MORIBUND
DEAD

GROSS SIGNS

NORMAL
DARK
POPEYED
OPEN LESIONS
BLUE COLOUR (SPOTS)
SCALE LOSS
HEMORRHAGING
FIN ROT
FIN EROSIONS
RED VENT
RED MOUTH
PARASITES
FUNGUS
OTHER

RECENT HANDLING

SORTING
TAGGING
SAMPLING
MOVING
GRADING
RESEARCH

WATER SOURCE

SURFACE
WELL
RIVER
CITY
LAKE
SALT
BRACKISH

WATER HARDNESS

EXTREMELY SOFT
VERY SOFT
SOFT
MODERATE
HARD
VERY HARD
EXTREMELY HARD

COMMENTS

Annexe Ib. Traduction de l'imprimé du rapport de cas

RAPPORT DE CAS

DATE : _____
LIEU D'ÉCHANTILLONNAGE : _____
NOM : _____
ESPÈCE : * _____
ÂGE : * _____
LONGUEUR (MM) : _____
POIDS (G) : _____
SEXE : * _____

RAISON DU RAPPORT : * _____
DATE DE COLLECTE : _____
ORIGINE DU STOCK : * _____

		PERTES	TEMP. DE 1'EAU °C
AUJOURD'HUI	(7)	_____	_____
SEMAINE DERNIÈRE	(6)	_____	_____
	(5)	_____	_____
	(4)	_____	_____
	(3)	_____	_____
	(2)	_____	_____
	(1)	_____	_____

CHOIX DE L'ESPÈCE

COHO
QUINNAT
QUINNAT D'ÉTÉ
QUINNAT D'AUTOMNE
SAUMON ROUGE
KÉTA
SAUMON ROSE
TRUITE « STEELHEAD » D'ÉTÉ
TRUITE « STEELHEAD » D'HIVER
DOLLY
TRUITE ARC-EN-CIEL
TRUITE FARDÉE
AUTRE

CHOIX DE L'ÂGE

OEUFS
ALEVINS VÉSICULÉS
ALEVINS (FIN DE RÉSORPTION)
ALEVINS NON VÉSICULÉS
SUJETS DE UN AN
SUJETS DE 2 ANS
SUJETS DE 3 ANS
SUJETS DE 4 ANS
ADULTES IMMATURES
ADULTES PLEINS
ADULTES VIDES
JACKS
AUTRE

CHOIX DU SEXE

FEMELLES
MÂLES
MIXTES
INCONNU

RAISONS DU RAPPORT

MORTALITÉ EN PISCIFACTURE
MORTALITÉ DANS LA NATURE
RECHERCHE
BILAN DE SANTÉ
CERTIFICATION
AUTRE

ORIGINE DU STOCK

SAUVAGE
ÉLEVAGE
SEMI-SAUVAGE
INCONNUE

RAPPORT DE CAS

TAILLE DE L'ÉCHANTILLON : _____
TYPE D'ÉCHANTILLON : * _____
NBRE DE BASSINS AFFECTÉS : _____
ID. DU BASSIN : _____
TYPE DE BASSIN : * _____
TAILLE LARGEUR : _____
LONGUEUR : _____
PROFONDEUR : _____
DIAMÈTRE : _____
INCONNUE : _____
CHARGE (POISSONS/BASSIN) : _____
DÉBIT DANS LE BASSIN : _____
VITESSE DANS LE BASSIN : _____

NOURRITURE : * _____
TYPE DE NOURRITURE : * _____
RATION : _____
(% DU POIDS CORPOREL)
MODE D'ALIMENTATION : * _____
TAILLE DES GRANULÉS : _____

TYPE D'ÉCHANTILLON	TYPE DE BASSIN
VIVANT	BASSIN « BURROWS »
MORT	BASSIN CIRCULAIRE
MORIBOND	BASSIN ALLONGÉ
ALÉATOIRE	PARCS EN FILET
MIXTE	BASSIN DE STABULATION
AUTRE	BACS D'ALEVINAGE
	BAC « CAP »
	FRAYÈRE ARTIFICIELLE
	ÉTANG À FOND DE TERRE
	PLATEAU « HEATH »
	BAC À GRAVIER
	ÉTANG NATUREL
	AUTRE

NOURRITURE	TYPE DE NOURRITURE	MODE D'ALIMENTATION
OMP	HUMIDE	À LA MAIN
BIODIET	SÈCHE	À LA MACHINE
SIVERCUP	MIXTE	AL. NATURELLE
RANGERS		
ABERNATHY		
APEX		
RESEARCH		
CUSLAN		
NATURELLE		
AUCUNE (JEÛNE)		
AUTRE		

RAPPORT DE CAS

COMPORTEMENT : * _____
SYMPTÔMES : * _____
MANIPULATION RÉCENTE : * _____
DIAGNOSTIC ANTÉRIEUR : _____
DIAGNOSTICIEN : _____
DIAGNOSTIC : _____
TRAITEMENT ANTÉRIEUR : _____
VACCINATION : _____

DIAGNOSTIC ANTÉRIEUR, TRAITEMENT ANTÉRIEUR ET VACCINATION : INDIQUER LA DATE LE CAS ÉCHÉANT

ORIGINE DE L'EAU : * _____
SALINITÉ : _____
OXYGÈNE DISSOUS : ENTRÉE : _____
SORTIE : _____
PR. TOT. DE GAZ : _____
DURETÉ : * _____
PH : _____
NH3 : _____

COMPORTEMENT

NORMAL
NE S'ALIMENTE PAS
RESTE EN SURFACE
RESTE À L'EXUTOIRE
APATHIQUE
MORIBOND
MORT

SYMPTÔMES

ASPECT NORMAL
COULEUR SOMBRE
EXOPHTALMIE
LÉSIONS OUVERTES
TACHES BLEUES
PERTE D'ÉCAILLES
HÉMORRAGIES
POURRITURE DES NAGEOIRES
ÉROSION DES NAGEOIRES
ANUS ROUGE
BOUCHE ROUGE
PARASITES
CHAMPIGNONS
AUTRE

MANIPULATION RÉCENTE

TRI
MARQUAGE
ÉCHANTILLONNAGE
DÉPLACEMENT
CLASSIFICATION
RECHERCHE

ORIGINE DE L'EAU

SURFACE
PUITS
RIVIÈRE
VILLE
LAC
EAU SALÉE
EAU SAUMÂTRE

DURETÉ DE L'EAU

EXTRÊMEMENT DOUCE
TRÈS DOUCE
DOUCE
MODÉRÉMENT DURE
DURE
TRÈS DURE
EXTRÊMEMENT DURE

COMMENTAIRES

Annexe II. Matrice des programmes

Diagnostic	Traitement	Application	Adulte juvénile	Alevin	Alevin vésiculé	Oeufs	Prévention	Lutte
Epistylis	Formol + vert de malachite	Long bain	x	x			x	x
	Formol	Bain de 1 h	x	x				x
Hexamita	Aucun	—	x	x	x		x	x
Glochidia (larves de mollusques parasites)	Aucun	—	x	x	x		x	x
Champignons	Vert de malachite	Long bain	x	x	x			x
	Vert de malachite	Lavage				x	x	x
	Vert de malachite	Immersion	x					x
	Formol + vert de malachite	Long bain	x	x			x	x
	Formol	Bain de 1 h	x	x				x
	Formol	Lavage				x	x	
	Permanganate de potassium	Bain de 1 h	x	x	x		x	
Septicémie à aéromonades motiles	Terramycin	Oral	x	x	x			x
	Furazolidone	Oral	x	x	x			x
	Ovadine	Immersion				x	x	
	Betadine	Immersion				x	x	
Gyrodactylus	Formol + vert de malachite	Long bain	x	x			x	x
Costia (Ichthyobodo)	Formol + vert de malachite	Long bain	x	x			x	x
Cryptobia	Aucun	—	x	x			x	x
Trichodina	Formol + vert de malachite	Long bain	x	x			x	x
	Formol	Bain de 1 h	x	x				x
Salmincola	Aucun	—	x	x	x		x	x
Trichophrya	Formol + vert de malachite	Long bain	x	x			x	x
	Formol	Bain de 1 h	x	x				x

Annexe II (suite)

Diagnostic	Traitement	Application	Adulte juvénile	Alevin	Alevin vésiculé	Oeufs	Prévention	Lutte
Ichthyophtiriase	Formol	Bain de 1 h	x	x				x
	Formol + vert de malachite	Long bain	x	x			x	
Vibriose	Vaccin	Immersion		x	x		x	
	Terramycin	Oral		x	x			x
	Furazolidone	Oral	x	x				x
	Sulfaméthazine + furazolidone	Oral	x	x				x
	Sulfamérazine	Oral	x	x	x			x
Maladie de la bouche rouge (ERD)	Vaccin	Immersion		x			x	
	Terramycin + sulfamérazine	Oral	x	x	x			x
	Furazolidone + sulfamérazine	Oral	x	x	x			x
	Terramycin + sulfaméthazine	Oral	x	x	x			x
	Terramycin	Oral	x	x	x			x
	Ovadine	Immersion				x	x	
	Betadine	Immersion				x	x	
Infection à *Flexibacter columnaris*	Terramycin	Oral	x	x	x			x
	Furanace	Bain statique		x	x			x
	Furazolidone	Oral	x	x	x			x
Sporocytophaga	Terramycin	Oral	x	x	x			x
	Furazolidone	Oral	x	x	x			x
	Furazolidone + sulfaméthazine	Oral	x	x	x			x
Tuberculose	Aucun	—	x	x	x		x	x
Infection à *Pseudomonas*	Terramycin	Oral	x	x	x			x
	Ovadine	Immersion				x	x	
	Betadine	Immersion				x	x	
Maladie bactérienne des branchies	Permanganate de potassium	Bain de 1 h	x	x	x		x	x
	Terramycin	Oral		x	x			x
	Roccal	Bain de 1 h	x	x				x
Infection à *Cytophaga psychrophilia*	Terramycin	Oral	x	x	x			x
	Furazolidone	Oral		x	x			x
	Sulfamérazine	Oral		x	x			x
	Sulfaméthazine	Oral		x	x			x
Furonculose	Terramycin	Oral	x	x	x		x	x
	Furazolidone	Oral	x	x	x			x
	Sulfamérazine	Oral	x	x	x			x
	Sulfaméthazine	Oral	x	x	x			x
	Sulfaméthazine + Terramycin	Oral	x	x	x			x

Annexe II (suite)

Diagnostic	Traitement	Application	Adulte juvénile	Alevin	Alevin vésiculé	Oeufs	Prévention	Lutte
	Terramycin	Injection	x				x	x
	Ovadine	Immersion				x	x	
	Betadine	Immersion				x	x	
Maladie	Aucun	—	x	x	x			x
bactérienne	Érythromycine	Injection	x				x	
du rein (BKD)	Gallimycin	Bain statique				x	x	
	Érythromycine	Oral	x	x			x	
	Betadine	Immersion				x	x	
	Ovadine	Immersion				x	x	
Maladie myxobacté-	Permanganate de potassium	Bain de 1 h		x	x		x	x
rienne des	Terramycin	Oral		x	x			x
branchies	Furanace	Bain statique		x	x		x	x
	Roccal	Bain de 1 h	x	x				x
Infection des	Permanganate de potassium	Bain de 1 h		x	x		x	x
branchies à bactéries	Terramycin	Oral		x	x			x
fusiformes	Furanace	Bain statique		x	x			x
	Terramycin	Bain statique	x	x	x		x	x

Annexe III. Mode d'administration et dosage recommandé pour chaque traitement

Traitement	Application	Dose[a]
Terramycin	Oral	3 g/100 lb de poisson pendant 10 d
	Bain statique	2 ppm 3 d de suite
	Injection	7,5 mg/lb de poisson
Furazolidone	Oral	3 g/100 lb de poisson pendant 14 d
Furanace	Bain statique	1-2 ppm une fois
Roccal	Bain	1 ppm une fois
Érythromycine	Oral	4,5 g/100 lb de poisson pendant 21 d
	Bain statique	2 ppm 3 d de suite
	Injection	10 mg/lb de poisson
Sulfamérazine	Oral	5 g/100 lb de poisson pendant 14 d
Sulfaméthazine	Oral	5 g/100 lb de poisson pendant 14 d
Terramycin + sulfamérazine	Oral	2 g/ 3 g/ 100 lb de poisson pendant 14 d
Terramycin + sulfaméthazine	Oral	2 g/ 3 g/ 100 lb de poisson pendant 14 d
Furazolidone + sulfamérazine	Oral	2 g/ 3 g/ 100 lb de poisson pendant 14 d
Furazolidone + sulfaméthazine	Oral	2 g/ 3 g/ 100 lb de poisson pendant 14 d
Formol	Bain	100 ppm pendant 1 h, une fois
	Bain	25 ppm pendant 8 h, trois fois
	Bain	250 ppm en lavage, une fois
Vert de malachite	Bain	1 ppm pendant 1 h, une fois
	Bain	0,5 ppm pendant un maximum de 8 h, une fois
	Bain	5 ppm en lavage, une fois
	Immersion	20 ppm pendant 1 min, une fois
Formol + vert de malachite	Bain	25 ppm + 0,1 ppm/pendant un maximum de 12 h, 3 d de suite
Vaccin	Immersion	Selon les instructions
Permanganate de potassium	Bain	1 ppm pendant 1 h, 2 d de suite
Ovadine (oeufs)	Immersion	100 ppm pendant 10 min, une fois
Betadine (oeufs)	Immersion	100 ppm pendant 10 min, une fois
Wescodyne (oeufs)	Immersion	100 ppm pendant 10 min, une fois

Annexe III (suite)

Traitement	Application	Dose[a]
Désinfection		
Roccal	—	600 ppm
Hyamine	—	600 ppm
Wescodyne	—	400 ppm
Ovadine	—	400 ppm
Betadine	—	400 ppm
HTH	—	158 ppm (matériel), 25 ppm (bassins)
Eau de javel	—	158 ppm (matériel), 25 ppm (bassins)
Anesthésiques		
MS222	—	75 mg/L d'eau pour usage général
	—	400 mg/L d'eau pour tuer le poisson
2-phénoxyéthanol	—	1:5000 pour usage général
Dioxyde de carbone	—	400 ppm

[a] Tous les dosages sont indiqués avec la quantité d'ingrédient actif nécessaire pour atteindre les résultats recherchés.

Annexe IV. Imprimé des sous-programmes

Santé des poissons (Fish Health)

```
90  REM  ###  FISH HEALTH  JULY 6,1983  ###
91  REM  ###  BY G.E. HOSKINS,  B.E. MCLEAN AND C.J. WEST ###
92  REM
100 D$ =  CHR$ (4):TA$ =  CHR$ (7)
110  DIM DL$(24),TL$(29),DS$(24,4),SD$(28),AI(14)
120  FOR I = 1 TO 6: READ ML$(I): NEXT
130  DATA INTRODUCTORY NOTES, ANESTHETICS, CHEMICAL NOTES, DISINFECTANTS,
      CASE REPORTER, DISEASE TREATMENT
140  HOME : VTAB 11: HTAB 13: PRINT "W O R K I N G": GOSUB 9900
150  HOME : FOR I = 20 TO 1 STEP  - 1: FOR J = 1 TO 22 STEP 21: VTAB J: HTAB
     I: PRINT "*": VTAB J: HTAB 41 - I: PRINT "*": NEXT : NEXT : FOR I =
     2 TO 21: VTAB I: HTAB 1: PRINT "*": VTAB I: HTAB 40: PRINT "*": NEXT

160  VTAB 1: PRINT "*************   FISH HEALTH  *************": VTAB 3: HTAB
     12: PRINT "( VERSION 19/10/82 )": FOR I = 1 TO 6: VTAB 2 * I + 6: HTAB
     8: PRINT I;"   ";ML$(I): NEXT :V = 5:U = 6:X$ = "ITEM": GOSUB 9100:M
     F = F
170  FOR I = 6 TO MF * 2 + 6:X =  PEEK ( - 16336):X =  PEEK ( - 16336): VTAB
     I - 1: HTAB 10: PRINT " ": HTAB 10: PRINT ">": FOR X = 1 TO 20: NEXT
     X: NEXT : GOSUB 9000: IF RS$ = "N" THEN 160
190  ON MF GOTO 5200,5500,6000,10000,5600,1000
997  REM
998  REM & TREATMENT CALCULATIONS
999  REM   && SELECT DIAGNOSIS
1000  HOME : VTAB 4: FOR I = 1 TO 18: PRINT  SPC( 2 -  LEN ( STR$ (I)));I
     ;" ";DL$(I): NEXT
1010  FOR I = 4 TO 9: VTAB I: HTAB 24: PRINT I + 15;" ";DL$(I + 15): NEXT

1020 V = 1:U = 24:X$ = "DIAGNOSIS": GOSUB 9100:DF = F: GOSUB 9000: IF RS$
      = "N" THEN 1020
1028  REM
1029  REM  && SELECT STAGE, P/C
1030  HOME : FOR I = 1 TO 4: VTAB I + 3: PRINT " ";I;"  ";SL$(I): NEXT : VTAB
     17: PRINT " 1  PREVENTION": PRINT " 2  CONTROL"
1040 V = 1:U = 4:X$ = "STAGE": GOSUB 9100:SF = F
1050 V = 14:U = 2:X$ = "PREVENT/CONTROL": GOSUB 9100:PF = F: GOSUB 9000: IF
     RS$ = "N" THEN 1040
1098  REM
1099  REM  # PRESENT TREAT/APP'S
1100 L =  LEN (DS$(DF,SF)) / 4: IF L > 0 THEN 1120
1110  PRINT TA$: PRINT TA$: HOME : SPEED= 150: PRINT "SORRY, NO TREATMENT
     S ON RECORD": VTAB 20: PRINT "PRESS ANY KEY TO RETURN TO MENU": SPEED=
     255: GET RS$: RUN
1120 T =  - 999999:D = 0: FOR I = 1 TO L:X$ =  MID$ (DS$(DF,SF),I * 4 - 3
     ,4):PC =  VAL ( MID$ (X$,4,1)): IF PC <  > PF AND PC <  > 3 THEN 118
     0
1130  IF  LEFT$ (X$,2) <  > "25" THEN  IF  LEFT$ (X$,2) <  > "13" THEN 11
     70
1140  IF T =  - 999999 THEN  PRINT TA$: HOME : PRINT  SPC( 18);"NOTE!": VTAB
     10: PRINT  SPC( 9);"WHAT IS THE TEMP ('C)"
1150  IF T =  - 999999 THEN  VTAB 10: HTAB 32: INPUT "";T: GOSUB 9000: IF
     RS$ = "N" THEN T =  - 999999: GOTO 1150
```

```
1160  IF T >  = 18 THEN 1180
1170 D = D + 1:DT$(D) = X$
1180  NEXT : IF D = 0 OR (D = 1 AND  LEFT$ (DT$(D),2) = "10") THEN 1110
1200  HOME : PRINT "SELECTED : DIAGNOSIS : ";DL$(DF): PRINT "========   P
     URPOSE : ";PL$(SF): PRINT "            STAGE : ";SL$(PF): VTAB 9: FOR
     I = 1 TO D:T =  VAL ( MID$ (DT$(I),1,2)):A =  VAL ( MID$ (DT$(I),3,1
     )): PRINT I;"  ";TL$(T);"  /  ";AL$(A): PRINT : NEXT
1210 V = 6:U = D:X$ = "TREATMENT / APPLICATION": GOSUB 9100:T = F: GOSUB
     9000: IF RS$ = "N" THEN 1210
1220 TF =  VAL ( MID$ (DT$(T),1,2)):AF =  VAL ( MID$ (DT$(T),3,1)): HOME
     : PRINT TL$(TF): VTAB 6: GOSUB 9300: GOSUB 9200
1228  REM
1229  REM  ## PRESENT NOTES ##
1230  HOME : PRINT TL$(TF): PRINT :NT = 2: IF TF <  = 24 THEN NT = 1: ON
     TF - 10 GOSUB 9310,9320,9330,9340,9350,9360,937C,9380,9390,9400,9410
     ,9410,9430,9440
1231  IF TF = 25 THEN  HOME : PRINT TL$(13): PRINT : GOSUB 9330: GOSUB 92
     00: HOME : PRINT TL$(17): PRINT : GOSUB 9370
1232  IF TF = 26 THEN  HOME : PRINT TL$(23): PRINT : GOSUB 9430: GOSUB 92
     00: HOME : PRINT TL$(21): PRINT : GOSUB 9410
1233  IF TF = 27 THEN  HOME : PRINT TL$(23): PRINT : GOSUB 9430: GOSUB 92
     00: HOME : PRINT TL$(22): PRINT : GOSUB 9410
1234  IF TF = 28 THEN  HOME : PRINT TL$(15): PRINT : GOSUB 9350: GOSUB 92
     00: HOME : PRINT TL$(21): PRINT : GOSUB 9410
1235  IF TF = 29 THEN  HOME : PRINT TL$(15): PRINT : GOSUB 9350: GOSUB 92
     00: HOME : PRINT TL$(22): PRINT : GOSUB 9410
1240  VTAB 23: HTAB 12: PRINT "(N=SELECT ANOTHER TREATMENT)": GOSUB 9000:
      IF RS$ = "N" THEN 1200
1250  HOME : PRINT "SELECTED APPLICATION ** ";AL$(AF);" **": VTAB 5: GOSUB
     9450
1280  VTAB 23: HTAB 12: PRINT "( N = ANOTHER APPLICATION )": GOSUB 9000: IF
     RS$ = "N" THEN 1200
1288  REM
1289  REM  ## PRESENT STANDARD DOSE ##
1290  HOME : PRINT "SELECTED : ";SL$(SF): PRINT "========   ";TL$(TF): PRINT
      SPC( 11);AL$(AF): PRINT  SPC( 11);DL$(DF);" ";PL$(PF)
1300 SD = 0: FOR I = 1 TO 28: IF  LEFT$ (SD$(I),3) =  STR$ (TF) +  STR$ (
     AF) THEN SD = I:I = 28
1310  NEXT :DO = 2: IF TF <  > 24 AND SD = 0 AND AF <  > 8 THEN  VTAB 11:
      PRINT "NO STANDARD DOSAGE ON RECORD.": PRINT : PRINT "YOU WILL HAVE
      TO ENTER THE REQUIRED     ": PRINT "CONCENTRATIONS.": GOSUB 9200: GOTO
     1350
1320  IF TF = 24 OR AF = 8 THEN  VTAB 11: PRINT "SEE MANUFACTURER'S INSTR
     UCTIONS": VTAB 20: PRINT "PRESS ANY KEY TO RESTART PROGRAM": VTAB 20
     : HTAB 38: GET RS$: RUN
1330  VTAB 7: GOSUB 9500: GOSUB 1700: GOSUB 9000: IF RS$ = "N" THEN 1290
1340  ON AF GOTO 1400,2000,1400,2000,2500,2200,2400,1320
1350 LD =  VAL ( MID$ ("2332121",AF,1)): FOR X = 1 TO LD:N$(X) = "":L$(X)
      =  MID$ ("PPMDAY   PPMMINDAYPPMHRSDAYPPMMIN   PPM      GMSDAY   MGS
          ",AF * 9 - 8 + (X - 1) * 3,3): NEXT : IF L$(LD) = "DAY" THEN L
     $(LD) = "DAYS"
1357  IF TF > 24 THEN  PRINT  CHR$ (7): PRINT "PROGRAM CAN'T CONTINUE": PRINT
     : PRINT "COMPLAIN TO CAM WEST": END
1360 DO = 1:NT = 1:T(1) = TF: VTAB 8: HTAB 1: CALL  - 958: PRINT "ENTER D
     OSAGE (ACTIVE INGREDIENT)": PRINT "============": PRINT : FOR X = 1 TO
     LD: PRINT  SPC( 9 -  LEN (L$(X)));L$(X);" = ": NEXT : FOR X = 1 TO L
     D
```

```
1370  VTAB 10 + X: HTAB 14: INPUT "";RS$:N$(X) = RS$: IF  VAL (RS$) = 0 THEN
      1370
1380  NEXT : GOSUB 9000: IF RS$ = "N" THEN 1360
1390  GOSUB 1740: GOSUB 9000: ON RS GOTO 1360,1340
1398  REM
1399  REM    ## CALC : 1 HR BATH & LONG BATH ##
1400  HOME :HR = 1: PRINT "** ";TL$(TF);" ";AL$(AF);" **": VTAB 6: PRINT
      "  1  STOCK SOLUTION CONC.": PRINT : PRINT "  2  PUMP METERING SPEED
      ": PRINT : PRINT "  3  POND INFLOW": PRINT : PRINT "  4  POND CONCEN
      TRATION"
1410 V = 4:U = 4:X$ = "ITEM TO BE CALCULATED": GOSUB 9100:CF = F
1420  IF TF = 25 THEN  GOSUB 1560: GOTO 1440
1430 V = 15: IF CF <  > 1 THEN  VTAB V: INPUT "  ENTER STOCK CONC. (PPM)
        ";CS$:CS =  VAL (CS$):V = V + 2: IF CS = 0 THEN V = V - 2: GOTO
      1430
1440  IF CF <  > 2 THEN  VTAB V: INPUT "  ENTER PUMP SPEED  (ML/MIN)   ";
      PS$:PS =  VAL (PS$):V = V + 2: IF PS = 0 THEN V = V - 2: GOTO 1440
1450  IF CF <  > 3 THEN  VTAB V: INPUT "  ENTER POND FLOW   (LPM)      ";
      Q$:Q =  VAL (Q$):V = V + 2: IF Q = 0 THEN  INPUT "  ENTER POND FLOW
        (CFS)      ";Q$:Q =  VAL (Q$) * 28.317 * 60:V = V + 1: IF Q = 0 THEN
      V = V - 3: VTAB V + 1: CALL  - 868: GOTO 1450
1460  IF TF = 25 THEN  GOSUB 1580: GOTO 1500
1470  IF CF <  > 4 THEN  VTAB V: PRINT  SPC( 31); VAL (N$(1)): VTAB V: INPUT
      "  ENTER POND CONC.  (PPM)      ";CP$:CP =  VAL (CP$): IF CP = 0 THEN
      CP =  VAL (N$(1)): VTAB V: HTAB 32: PRINT CP
1500  IF CF = 1 THEN CS = CP * (Q * 1000 + PS) / PS: IF TF = 25 THEN C2S =
      C3P * (Q * 1000 + PS) / PS
1510  IF CF = 2 THEN PS = (Q * 1000 + PS) * CP / CS
1520  IF CF = 3 THEN Q = (CS * PS / CP - PS) / 10
1530  IF CF = 4 THEN CP = CS * PS / (Q * 1000 + PS): IF TF = 25 THEN C3P =
      C2S * PS / (Q * 1000 + PS)
1540 LH = PS * 6 / 100:GM = 48 * CS * .00208333 / AI(3) / 100:G2M = 48 *
      C2S * .00208333 / AI(7) / 100: IF AF = 3 THEN HR =  VAL (N$(2)): IF
      TF > 24 THEN HR =  VAL (N$(3))
1546  GOSUB 9000: IF RS$ = "N" THEN 1400
1548  REM
1549  REM   ## TABLE RESULTS ##
1550  GOTO 4000
1560 V = 15: IF CF <  > 1 THEN  VTAB V: INPUT "  ENTER FORM.STOCK CONC. (
      PPM) ";RS$:CS =  VAL (RS$): INPUT "  ENTER MAL. STOCK CONC. (PPM) ";
      RS$:C2S =  VAL (RS$):V = V + 3: IF CS = 0 OR C2S = 0 THEN V = V - 3:
       GOTO 1560
1570  RETURN
1580  IF CF <  > 4 THEN H = 32: VTAB V: PRINT "  ENTER POND FORM. CONC. (
      PPM) "; VAL (N$(1)): PRINT "  ENTER POND MAL.  CONC. (PPM) "; VAL (N
      $(2)): VTAB V: HTAB H: INPUT "";RS$:CP =  VAL (RS$): IF CP = 0 THEN
      CP =  VAL (N$(1)): VTAB V: HTAB H: PRINT CP
1590  IF CF <  > 4 THEN V = V + 1: VTAB V: INPUT "  ENTER POND MAL.  CONC
      . (PPM) ";RS$:C3P =  VAL (RS$): IF C3P = 0 THEN C3P =  VAL (N$(2)): VTAB
      V: HTAB H: PRINT C3P
1600  RETURN
1698  REM
1699  REM  ##### CHECK DOSE AND A.I. ##
1700  VTAB 18: PRINT "   STANDARD DOSE OK ?":V = 18:H = 21: GOSUB 9010:DO
      = 2: IF RS$ = "Y" THEN DO = 1: GOTO 1730
```

```
1710  VTAB 17: CALL  - 958: POKE 33,7: FOR I = 1 TO LD:V = 9 + I: VTAB V:
      POKE 34,V - 1: POKE 35,V + 1: INPUT "";RS$: IF RS$ = "" THEN RS$ =
     N$(I): VTAB V: PRINT RS$
1720 N$(I) = RS$: POKE 35,20: NEXT : POKE 33,40: POKE 34,0: POKE 35,24: VTAB
     20: PRINT "DOSES OK (Y/N) ?":V = 20:H = 16: GOSUB 9010: IF RS$ = "N"
      THEN 1710
1730  IF AF = 7 THEN 1790
1740  FOR I = 1 TO NT:A(I) = AI(T(I) - 10): NEXT
1750  VTAB 15: HTAB 1: CALL  - 958: PRINT "A.I. OF CHEMICALS :": PRINT "=
     ================": PRINT : FOR I = 1 TO NT: PRINT  SPC( 7 -  LEN ( STR$
     (A(I) * 100)));A(I) * 100;" % ";TL$(T(I))
1752 X$ =  LEFT$ (TL$(T(I)),3): IF X$ = "BRI" OR X$ = "OVA" OR X$ = "WES"
      OR X$ = "BET" THEN  VTAB  PEEK (37): HTAB 22: PRINT "(IODINE)"
1755  NEXT : VTAB 21: PRINT "A.I.'S  OK ?":V = 21:H = 12: GOSUB 9010: IF
     RS$ = "Y" THEN 1780
1760  POKE 33,7: FOR I = 1 TO NT:V = 17 + I: VTAB V: POKE 34,V - 1: POKE
     35,V + 1: INPUT "";RS$: IF RS$ = "" THEN RS$ =  STR$ (A(I) * 100): VTAB
     V: PRINT RS$
1770 A(I) =  VAL (RS$) / 100: POKE 35,20: NEXT : POKE 33,40: POKE 34,0: POKE
     35,24:V = 21: VTAB V: PRINT "A.I.'S OK (Y/N) ?":H = 17: GOSUB 9010: VTAB
     21: CALL  - 868: IF RS$ = "N" THEN 1750
1780  RETURN
1790  VTAB 14: HTAB 1: CALL  - 958: PRINT "INJECTION SOLUTION": PRINT "==
     ================": PRINT : INPUT "     MG A.I. / ML = ";RS$
1800 A(1) =  VAL (RS$):X =  VAL (N$(1)) /  VAL (RS$): IF 0 > X OR X >  =
     .25 THEN  PRINT : PRINT "!!!! INJECTION VOLUME TOO GREAT !!!!": GOSUB
     9200: GOTO 1790
1810  RETURN
1998  REM
1999  REM  ## DIP & STATIC BATH ROUTINE ##
2000  HOME :DC =  VAL (N$(1)):AI = A(1): PRINT "ARE VOLUME CALCULATIONS N
     EEDED ?": PRINT : PRINT " ( Y = CALCULATIONS ),  (Y/N) ":V =  PEEK (
     37):H = 32: GOSUB 9010: IF RS$ = "Y" THEN 2070
2010  FOR I = 1 TO 5: VTAB 10 + I: PRINT " ";I;"  ";UL$(I): NEXT :V = 9:U
      = 5:X$ = "UNIT": GOSUB 9100:UF = F
2020  VTAB 18: PRINT "ENTER VOLUME IN ";UL$(UF): VTAB 18: HTAB 26: INPUT
     "";V$:VI =  VAL (V$):VL = VI * UC(UF): IF VI = 0 THEN 2020
2030  GOSUB 9000: IF RS$ = "N" THEN 2000
2040  GOTO 2150
2070  HOME : FOR I = 1 TO 4: VTAB I + 2: PRINT " ";I;"  ";CL$(I): NEXT : FOR
     I = 1 TO 5: VTAB 11 + I: PRINT " ";I;"  ";UL$(I + 5): NEXT :V = 1:U =
     4:X$ = "CONTAINER": GOSUB 9100:CF = F:V = 10:U = 5:X$ = "UNIT": GOSUB
     9100:UF = F + 5
2080  FOR I = 1 TO 7: VTAB I + 9: CALL  - 868: NEXT : VTAB 10: PRINT "ENT
     ER ";CL$(CF);" DIMENSIONS": PRINT : PRINT " IN ";UL$(UF)
2090  VTAB 15: INPUT "-DEPTH         ";DD$:D =  VAL (DD$): IF CF = 2 THEN
      INPUT "-DIAMETER      ";R$:R =  VAL (R$) / 2:VI = D * 3.14159265 * R
      © 2: GOTO 2130
2100  IF CF = 4 THEN  INPUT "-TOP WIDTH     ";TW$:TW =  VAL (TW$): INPUT "
     -BOTTOM WIDTH ";BW$:BW =  VAL (BW$):W = (TW + BW) / 2: GOTO 2120
2110  INPUT "-WIDTH         ";W$:W =  VAL (W$)
2120  INPUT "-LENGTH        ";L$:L =  VAL (L$):VI = D * W * L: IF CF = 3 THEN
     VI = (L - W) * W + 3.14159265 * (W / 2) © 2
2130  IF VI = 0 THEN 2090
2140 VL = VI * UC(UF) © 3 / 1000: VTAB 20: PRINT "VOLUME (CU. ";UL$(UF);"
     ) = "; INT (VI * 1000 + .5) / 1000: PRINT  SPC( 7);"   ( LITERS ) =
     "; INT (VL * 1000 + .5) / 1000: GOSUB 9000: IF RS$ = "N" THEN 2000
```

```
2150  GOTO 4000
2198  REM  ## ORAL TREATMENT ##
2199  REM
2200  HOME : PRINT "INPUT TOTAL FISH WEIGHT IN POND"
2210  VTAB 7: PRINT " 1   TOTAL WEIGHT (LB) =": PRINT : PRINT : PRINT " 2
      TOTAL WEIGHT (KG) =": PRINT : PRINT : PRINT " 3   NO. OF FISH =":
      PRINT "       FISH / LB =": PRINT : PRINT " 4   NO. OF FISH =": PRINT
     "       GM / FISH ="
2220 V = 4:U = 4:X$ = "METHOD": GOSUB 9100:WF = F: ON WF GOTO 2230,2240,2
     250,2260
2230  VTAB 7: HTAB 27: INPUT "";RS$:W =  VAL (RS$): GOTO 2270
2240  VTAB 10: HTAB 27: INPUT "";RS$:W =  VAL (RS$) * 2.20463414: GOTO 22
     70
2250  VTAB 13: HTAB 20: INPUT "";RS$:N =  VAL (RS$): HTAB 20: INPUT "";RS
     $:W = N /  VAL (RS$): GOTO 2270
2260  VTAB 16: HTAB 20: INPUT "";RS$:N =  VAL (RS$): HTAB 20: INPUT "";RS
     $:W = N *  VAL (RS$) / 454: GOTO 2270
2270  VTAB 20: PRINT "****  TOTAL WEIGHT OF FISH IN POND  ****": PRINT  SPC(
     11);"        = "; INT (W);" LB"
2280  GOSUB 9000: IF RS$ = "N" THEN 2200
2310  GOTO 4000
2398  REM
2399  REM  ## INJECTION ##
2400  GOTO 4000
2498  REM
2499  REM  ##  FLUSH ##
2500  HOME : PRINT "INPUT FLOW": PRINT : PRINT : PRINT : PRINT : PRINT "1
      GPM(IMP) =": PRINT : PRINT "2   GPM(US)  =": PRINT : PRINT "3   C
     FS      =": PRINT : PRINT "4   LPM      ="
2510 V = 4:U = 4:X$ = "METHOD": GOSUB 9100: VTAB 2 * F + 4: HTAB 16: INPUT
     "";RS$:UC(3) = UC(3) * 60:UC(4) = 1:LPM =  VAL (RS$) * UC(F): IF  VAL
     (RS$) = 0 THEN 2510
2520  VTAB 15: PRINT "FLOW = ";LPM;" LPM": VTAB 18:D =  VAL (N$(1)): PRINT
     TL$(TF) + " DOSE = ";D;" PPM/MIN"
2540  VTAB 20: PRINT "DO YOU HAVE A STOCK": PRINT TL$(TF);" SOLUTION (Y/N
     ) ?":V = 21:H =  LEN (TL$(TF)) + 17: GOSUB 9010:CS = .01: IF TF = 13
      THEN CS = .10
2550  VTAB 20: HTAB 1: CALL  - 868: VTAB 21: CALL  - 868: VTAB 20: PRINT
     "STOCK ";TL$(TF);" SOLUTION = ": IF RS$ = "N" THEN  VTAB 20: HTAB H +
     2: PRINT CS * 100;" % A.I.": GOTO 2570
2560  VTAB 20: HTAB H + 8: PRINT "% A.I.": VTAB 20: HTAB H + 3: INPUT "";
     RS$:CS =  VAL (RS$) / 100: VTAB 20: HTAB H + 8: PRINT "% A.I.": IF C
     S = 0 THEN 2560
2570  GOSUB 9000: IF RS$ = "N" THEN 2500
2578  REM
2579  REM  ##  OUTPUT  ##
2580  GOTO 4000
3998  REM
3999  REM  ## OUTPUT TABLE ##
4000  HOME :HC = 0:U$ = " GM ":U2$ = U$: IF TF = 11 OR TF = 13 OR TF = 18
      OR TF = 20 OR TF = 25 OR MF = 2 AND LF = 1 THEN U$ = " ML "
4010  IF HC = 1 THEN  PRINT " ": PRINT TITLE$: PRINT
4020  PRINT DL$(DF);" ";PL$(PF): PRINT SL$(SF): PRINT " ":RS$ = "  " + TL
     $(TF) + "  " + AL$(AF) + "  ": FOR X = 1 TO  INT ((39 -  LEN (RS$)) /
     2):RS$ = "*" + RS$ + "*": NEXT : PRINT RS$: PRINT : ON AF GOSUB 4100
     ,4200,4100,4200,4400,4300,4350,4600
```

```
4030  PR# 0: VTAB 23: FOR X = 1 TO 1000: NEXT : POKE  - 16368,0: PRINT "H
     ARDCOPY (Y/N)     (N = RETURN TO MENU)":V = 23:H = 16: GOSUB 9010: IF
     RS$ = "N" THEN  RUN
4040  IF HC = 0 THEN HC = 1: PRINT : PRINT "ENTER TITLE ( DO NOT USE ANY
     COMMAS )": INPUT TITLE$
4050  PR# 1: PRINT " ": GOTO 4010
4098  REM
4099  REM  ## TABLE : 1 HR BATH, LONG BATH ##
4100  PRINT "  POND FLOW   (LPM)          = "; INT (Q): PRINT : PRINT "
     PUMP SPEED  (ML/MIN)       = "; INT (PS): PRINT : IF TF = 25 THEN 41
     30
4110  PRINT "  STOCK CONC. (PPM A.I.)     = "; INT (CS * 10 + .5) / 10: PRINT
     : PRINT "  POND CONC.  (PPM A.I.)     = "; INT (CP * 10 + .5) / 10: GOSUB
     4170
4120  PRINT "************ STOCK RECIPE ***************": PRINT "  "; INT (
     GM * LH * HR / A(1) * 10 + .5) / 10;U$;TL$(TF);" (";A(1) * 100;" % A
     .I.)": PRINT : PRINT "  MADE UP TO "; INT (LH * HR * 10 + .5) / 10;"
      LITRES WITH WATER": RETURN
4130  PRINT "  STOCK (PPM A.I.)  FORMALIN = "; INT (CS * 100 + .5) / 100:
      PRINT  SPC( 19);"MALACHITE = "; INT (C2S * 100 + .5) / 100: PRINT :
      PRINT "  POND (PPM A.I.)   FORMALIN = "; INT (CP * 100 + .5) / 100:
      PRINT  SPC( 19);"MALACHITE = "; INT (C3P * 100 + .5) / 100: GOSUB 4
     170
4140  PRINT "************ STOCK RECIPE ***************"
4150  PRINT "  "; INT (GM * LH * HR / A(1));" ML FORMALIN  (";A(1) * 100;
     " % A.I.)": PRINT "  "; INT (G2M * LH * HR / A(2) * 100 + .5) / 100;
     " GM MALACHITE  ("A(2) * 100;" % A.I.)": PRINT "  MADE UP TO "; INT
     (LH * HR);" LITRES WITH WATER": RETURN
4170  PRINT : IF AF = 3 THEN  PRINT "  "; INT (LH * HR * 100 + .5) / 100;
     " LITERS OF STOCK SOL. OVER ";HR;" HR": PRINT
4180  RETURN
4198  REM
4199  REM  ## DIP, STATIC BATH TABLE ##
4200 GL =  INT (DC / AI * 10000 + .5) / 10000000:GT =  INT (DC * VL / AI +
     .5) / 1000: PRINT : PRINT "  TREATMENT CONC. = ";DC;" PPM A.I.": PRINT
     : IF GT >  = 1000 THEN GT =  INT (GT)
4210  IF MF = 6 THEN  PRINT "  APPLY FOR ";N$(2);" MIN.": PRINT
4220 VI =  INT (VI * 1000 + .5) / 1000:VL =  INT (VL * 1000 + .5) / 1000:
      IF MF = 2 AND LF = 1 THEN TL$(TF) = TL$(TF) + " STOCK"
4230 U2L$ = "": IF UF > 5 THEN U2L$ = "CU": IF VL >  = 1000 THEN VL =  INT
     (VL)
4240  IF VL >  = 1000 THEN VL =  INT (VL)
4250  PRINT : PRINT "*********   BATH PREPARATION   *********": PRINT : PRINT
      SPC( 6 -  LEN ( LEFT$ ( STR$ (GT),6)));GT;U$;" ";TL$(TF);" (";AI *
     100;" % A.I.)": PRINT : PRINT " IN "; INT (VI * 1000 + .5) / 1000;"
     ";U2L$;" ";UL$(UF);"  ("; INT (VL * 10 + .5) / 10;" LITERS)"
4260  IF MF = 2 THEN  PRINT : PRINT : PRINT "THIS IS  GUIDELINE AND VARIE
     S WITH TEMP ": PRINT "TRY A TEST GROUP IF NOT FAMILIAR !!!!!"
4270  RETURN
4297  REM
4298  REM  ##  ORAL TABLE  ##
4299  REM
4300  FOR I = 1 TO NT: PRINT "  "; VAL (N$(I));" "L$(I);" ";TL$(T(I));" A
     .I./100 LB/DAY": PRINT : NEXT : PRINT "  "; VAL (N$(1 + NT));" ";L$(
     1 + NT): PRINT : PRINT "  "; INT (W);" LB OF FISH": PRINT
```

```
4310  PRINT "**************  RECIPE  **************": PRINT : FOR I = 1 TO
     NT: PRINT "  "; INT ( VAL (N$(I)) * W / A(I) + .5) / 100;" ";L$(I);"
      ";TL$(T(I));" / DAY": PRINT  SPC( 13);"(";A(I) * 100;" % A.I.)": PRINT
     : NEXT : RETURN
4347  REM
4348  REM  ##  INJECTION  ##
4349  REM
4350  PRINT :X =  INT ( VAL (N$(1)) * 100 / A(1) + .5) / 100: PRINT  SPC(
     6 -  LEN ( STR$ (X)));X;" ML ";TL$(TF);" SOLUTION": PRINT : PRINT  SPC(
     10);"/ LB OF FISH": PRINT : PRINT : PRINT "**************  RECIPE
     *************": PRINT
4360  PRINT "     SOLUTION = ";A(1);" MG A.I./ ML": RETURN
4397  REM
4398  REM  ## FLUSH TABLE ##
4399  REM
4400  PRINT "  ";D;" PPM TREATMENT :": PRINT : PRINT "  "; INT (.25 * LPM
      / CS + .5) / 10;" ML ";TL$(TF);" STOCK SOL.": PRINT "        (";CS *
     100;" %  A.I. STOCK SOL.)": PRINT : PRINT "  INTO ";LPM;" LPM FLOW":
      PRINT
4410  PRINT "********  ";CS * 100;" %  STOCK RECIPE  ********": PRINT :UL$
      = " ML": IF TF <  > 13 THEN UL$ = " GM "
4420  PRINT "  "; INT (CS * 10000 / A(1) + .5) / 10;UL$;TL$(TF);" (";A(1)
      * 100;" % A.I.)/ LITER": PRINT : IF TF = 13 THEN  PRINT "  NOTE.: 1
     00 % FORMALIN": PRINT  SPC( 11);"= 37 % FORMALDEHYDE": PRINT
4430  IF TF = 17 THEN  PRINT : PRINT "FLUSH NOT RECOMMENDED AFTER EYED ST
     AGE  ": PRINT "2 PPM METERED FOR 1 HR IS PREFERRED": PRINT : PRINT "
     ****************************************"
4440  RETURN
4998  REM
4999  REM  ###  EQUIPMENT DISINFECTION  ###
5000  HOME :LS = 0: PRINT "**** ";ML$(MF);" ****": VTAB 5: FOR I = 1 TO 7
     : PRINT "  ";I;"  ";TL$(I + 10): PRINT : NEXT :U = 7:V = 3:X$ = "DI
     SINFECTANT": GOSUB 9100:TF = F + 10:A(1) = AI(TF - 10): VTAB F * 2 +
     3: HTAB 5: PRINT ">": IF F = 7 THEN LS = 1
5010  IF TF > 15 THEN  VTAB 21: PRINT "  1  EQUIP. DISINFECTION": PRINT
     "  2  POND  DISINFECTION":V = 19:U = 2:X$ = "CHLORINE USE": GOSUB
     9100:CLF = F: GOSUB 9000: IF RS$ = "N" THEN 5000
5020  IF TF > 15 THEN  GOSUB 8830: GOSUB 9200: HOME : ON CLF GOSUB 8860,8
     870: GOSUB 9000: IF RS$ = "N" THEN 5000
5030  IF TF = 11 THEN  VTAB 21: PRINT "  1  ROCCAL  10 %  A.I.": PRINT "
      2  ROCCAL  20 %  A.I.":V = 19:U = 2:X$ = "ROCCAL CONCENTRATION": GOSUB
     9100:AI(TF - 10) = AI(TF - 10) * F: GOSUB 9000: IF RS$ = "N" THEN 50
     00
5040  IF TF = 12 THEN  VTAB 21: PRINT "  1  HYAMINE 1622  SOLID  (100 % A
     .I.)": PRINT "  2  HYAMINE 1622  LIQUID  (50 % A.I.)":V = 19:U = 2:X
     $ = "HYAMINE TYPE": GOSUB 9100:AI(TF - 10) = AI(TF - 10) / F:LS = 2 -
     F: GOSUB 9000: IF RS$ = "N" THEN 5000
5050  IF TF > 12 AND TF < 16 THEN  GOSUB 9000: IF RS$ = "N" THEN 5000
5060  HOME : PRINT TL$(TF): PRINT : PRINT ML$(MF): VTAB 7:AF = 2:NT = 1:S
     D = TF - 10: IF TF > 15 THEN SD$(TF - 10) = "0" +  STR$ (TF - 10) +
     "5" +  MID$ (SD$(5 + CLF),4,3)
5070  GOSUB 9500: GOSUB 1700:AL$(AF) = "DISINFECTANT BATH"::DF = 1:DL$(DF
     ) = "":PF = 1:PL$(PF) = "":SF = 1:SL$(SF) = ""
5080 TL$(13) = TL$(TF):TL$(14) = TL$(TF):TF = 13 + LS: HOME : GOSUB 2000:
      RUN
```

```
5198  REM
5199  REM  ## DOCUMENTATION ##
5200  HOME : VTAB 3: PRINT "  THIS PROGRAM HAS BEEN PREPARED FOR": PRINT
      : PRINT "USE IN THE FEDERAL FACILITIES OF THE": PRINT : PRINT "SALMO
      NID ENHANCEMENT PROGRAM IN": PRINT : PRINT "BRITISH COLUMBIA."
5210  VTAB 15: PRINT "  CARE SHOULD BE TAKEN WHEN USING": PRINT : PRINT "
      THIS PROGRAM AT ANY OTHER LOCATION.": GOSUB 9200
5220  HOME : VTAB 3: PRINT "  FOR INFORMATION, CONTACT:": VTAB 6: PRINT "
       -  GARY HOSKINS": PRINT "      DIAGNOSTIC SERVICE": PRINT "      DEP
      T. OF FISHERIES & OCEANS":: PRINT "      PACIFIC BIOLOGICAL STATION":
       PRINT "      NANAIMO,BC"
5230  VTAB 13: PRINT "  -  CAM WEST  OR  BILL MCLEAN": PRINT "      SALMON
      ID ENHANCEMENT PROGRAM": PRINT "      DEPT. OF FISHERIES & OCEANS": PRINT
      "      1090 WEST PENDER ST": PRINT "      VANCOUVER,BC"
5240  GOSUB 9200
5250  HOME : PRINT "NOTE !!!": PRINT : PRINT "THE CHEMICALS REFERRED TO A
      RE COMMONLY  USED IN FEDERAL B.C. FACILITIES.": PRINT
5260  PRINT "  THE SELECTION OF DISEASES IN THIS      PROGRAM ARE FOUND IN
       B.C. WATERS.  THE  TREATMENTS GIVEN ARE RECOMMENDED BY THE DISEASE
      DIAGNOSTICS LAB, DFO."
5270  PRINT : PRINT "  TREATMENT/APPLICATIONS ARE LISTED IN  ORDER OF PRE
      FERENCE.  THEREFORE, THOSE  AT THE TOP OF THE LIST ARE THE MOST
      HIGHLY RECOMMENDED.": PRINT
5280  PRINT "  OPERATION OF THE DISEASE PROGRAM IS   SIMPLE.  ILLEGAL ENT
      RIES ARE NOT RECOG- NIZED.  ANY ENTRY CAN BE CHANGED BY      PRESSING
       <N> WHEN ASKED 'OK (Y/N)'.      THIS REPEATS THE MOST RECENT SCREEN
      OF  QUESTIONS."
5290  GOSUB 9000: IF RS$ = "N" THEN 5250
5300  HOME : PRINT "  OPTIONS HAVE BEEN GIVEN FOR ALL       FORESEEN INST
      ANCES IN WHICH THE USER MAYREFER TO DIFFERENT PONDS AND/OR USE ONE O
      F MANY POSSIBLE UNITS OF MEASURE."
5310  PRINT : PRINT "  WHEN ENTERING THE POND FLOW FOR       LONG BATH OR
       1 HOUR BATH CALCULATIONS,  PRESSING THE RETURN KEY WILL ALTERNATE
      THE UNITS BETWEEN LPM AND CFS.": PRINT
5320  PRINT "  BY PRESSING  'CTRL R'  YOU MAY RETURN DIRECTLY TO THE MAIN
       MENU FROM ANY PART OF THE PROGRAM.  'CTRL P'  WILL  COPY   VIDEO DI
      SPLAYS ONTO THE PRINTER.  CTRL  COMMANDS MAY BE USED WHEN THESE REQU
      ESTSAPPEAR :": PRINT
5330  PRINT "     1)  OK (Y/N) ?": PRINT "     2)  SELECT # ?": PRINT "
      3)  (PRESS ANY KEY TO CONTINUE) ? ": GOSUB 9200
5350  HOME : PRINT "NOTE : A.I. IS USED AS THE SHORT FORM OF       ACTIVE
       INGREDIENT.": VTAB 13: HTAB 4: PRINT "( ANY SUGGESTIONS TO IMPROVE
      THE          DISEASE PROGRAM ARE WELCOME.  )"
5360  VTAB 23: HTAB 1: PRINT "PRESS ANY KEY TO RETURN TO THE MENU": VTAB
      23: HTAB 39: GET RS$: RUN
5498  REM
5499  REM   ## ANESTHETIC ##
5500 LF = 0:TL$(11) = "MS222":TL$(12) = TL$(11):TL$(13) = "2-PHENOXYETHAN
      OL":TL$(14) = "CO2":N$(1) = " 75":N$(2) = "400":N$(3) = "200":A(1) =
      1
5510  HOME : PRINT "ANESTHETIC": PRINT "**********": VTAB 8: PRINT " 1  M
      S222 -  75 MG / L FOR GENERAL USE": PRINT : PRINT " 2  MS222 - 400 M
      G / L TO KILL FISH": PRINT : PRINT " 3  2-PHENOXYETHANOL - 0.2  ML /
       LITRE": PRINT  SPC( 23);"FOR GENERAL USE"
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```
5520  PRINT : PRINT " 4  CO2   -  200 TO 400 MG/L":AL$(2) = "ANESTHETIC B
      ATH":AF = 2:DF = 1:DL$(1)="":PF = 1:PL$(1) = "":SF = 1:SL$(1) = "":U
       = 4:V = 5:X$ = "ANESTHETIC": GOSUB 9100:N$(1) = N$(F):TF = F + 10: IF
      F = 3 THEN LF = 1
5530  IF TF < 14 THEN V = 18: VTAB V: PRINT "ARE YOU USING A STOCK SOLUTI
      ON ?":H = 32: GOSUB 9010: IF RS$ = "N" THEN 5550
5540 LF = 1: VTAB 20: HTAB 1: INPUT "STOCK CONCENTRATION (A.I. %) = ";RS$
      :A(1) =  VAL (RS$) / 100: IF A(1) = 0 THEN 5540
5550  HOME : PRINT TL$(TF);" :": PRINT : ON TF - 10 GOSUB 8900,8900,8910,
      8920: VTAB 23: HTAB 13: PRINT "( N = ANOTHER ANESTHETIC )": GOSUB 90
      00: IF RS$ = "N" THEN 5510
5560  IF TF = 12 THEN AL$(2) = "DIP FOR KILLING"
5570  IF TF = 14 THEN  RUN
5580  HOME : GOSUB 2000: RUN
5598  REM
5599  REM  ### DISEASE CASE REPORTS ##
5600  HOME : VTAB 11: HTAB 13: PRINT "W O R K I N G": PRINT D$;"RUN";ML$(
      MF)
5998  REM
5999  REM ## CHEMICAL NOTES ##
6000  HOME : VTAB 3: FOR I = 1 TO 14: PRINT  SPC( 3 -  LEN ( STR$ (I)));I
      ;"  ";TL$(I + 10): NEXT : PRINT : FOR I = 1 TO 6: PRINT  SPC( 3 -  LEN
      ( STR$ (I + 14)));I + 14;"  ";DIL$(I): NEXT : FOR I = 1 TO 3: VTAB 1
      7 + I: HTAB 23: PRINT  SPC( 3 -  LEN ( STR$ (I + 20)));I + 20;"  ";A
      NL$(I): NEXT
6002  VTAB 23: HTAB 14: PRINT ", BLEACH, HYPOCHLORITES": VTAB 1
6010 V = 1:U = 23:X$ = "": GOSUB 9100: HOME : IF F < 15 THEN  PRINT TL$(F
       + 10);" :": GOTO 6040
6020  IF F < 21 THEN  PRINT DIL$(F - 14);" :": GOTO 6040
6030  PRINT ANL$(F - 20);" :"
6040  VTAB 3: ON F GOSUB 9310,9320,9330,9340,9350,9360,9370,9380,9390,940
      0,9410,9410,9430,9440,9310,8810,9380,9400,8820,8830,8900,8910,8920
6050  VTAB 22: HTAB 14: PRINT "(Y = RETURN TO MENU)": PRINT  SPC( 13);"(N
      = SELECT ANOTHER NOTE)": GOSUB 9000: IF RS$ = "N" THEN 6000
6060  RUN
8798  REM
8799  REM   ##  DISINFECTANT NOTES  ##
8810  PRINT "1 50% ACTIVE INGREDIENT IN LIQUID FORM. ": PRINT : PRINT "2
      100% ACTIVE INGREDIENT IN POWDER.     ": PRINT : PRINT "3 USE AS GEN
      ERAL HATCHERY DISINFECTANT. ": PRINT
8811  PRINT "4 NOT RECOMMENDED FOR USE DIRECTLY ON   ": PRINT "  FISH.": PRINT
      : PRINT : RETURN
8820  PRINT "1 ACTIVE INGREDIENT 1.6% (16,000 MG/L)  ": PRINT "  AVAILABL
      E IODINE.": PRINT : PRINT : PRINT "2 IF USED TO DISINFECT EGGS, CHEC
      K PH    ": PRINT "  AND ADJUST TO 7.0 WITH": PRINT
8821  PRINT "  SODIUM BICARBONATE (BAKING SODA).     ": PRINT : PRINT "3
      SINCE WESCODYNE CONTAINS A WETTING     ": PRINT "  AGENT, IT IS A GOO
      D GENERAL PURPOSE   ": PRINT "  DISINFECTANT BUT RINSE WELL AFTER US
      E.": RETURN
8829  REM   ## CHLORINE NOTES ##
8830  HOME : PRINT "CHLORINE": PRINT "DOMESTIC BLEACH": PRINT "SODIUM HYP
      OCHLORITE": PRINT "CALCIUM HYPOCHLORITE": PRINT : PRINT "1.USE FOR P
      OND OR EQUIPMENT DISINFECTION  ONLY.  DO NOT USE IN NATURAL OR SEMI-
         NATURAL CHANNELS, IT KILLS VEGETATION."
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8831  PRINT "2.USE WITH EXTREME CAUTION, IT IS HIGHLY  TOXIC AT VERY LOW
      CONCENTRATIONS.     ": PRINT : PRINT "3.ALWAYS CONSIDER EFFECTS OF T
      HE SPENT    CHEMICAL ON THE ENVIRONMENT.           NEUTRALIZE WITH
      SODIUM THIOSULFATE"
8832  PRINT "  (NA2SO2O3) BEFORE RELEASE INTO ANY      WATER SYSTEM (111.
      3 MG/L SOLUTION).   ": GOSUB 9200: VTAB 21: PRINT "4.HIGH-TEMPERATUR
      ES AND LOW PH OVER A     LONG TIME GIVE THE MOST EFFECTIVE       BAC
      TERICIDAL ACTION.": PRINT
8833  PRINT "5.IF NECCESSARY, ADD ACID (H2SO4) SLOWLY  TO THE WATER TO LO
      WER PH AND INCREASE   THE AMOUNT OF FREE CHLORINE, OR USE     HYPOCH
      LOROUS ACID IN SOLUTION. DO NOT   INHALE THE CHLORINE GAS PRODUCED B
      Y     THESE MIXTURES."
8834  PRINT : PRINT "5.ACTIVE INGREDIENT WILL VARY DEPENDING   ON THE TYP
      E OF CHLORINE USED.  CONSULT  THE LABEL.": PRINT : PRINT : PRINT : PRINT
      : RETURN
8849  REM  ## CHLORINE PROCEDURES ##
8860  PRINT "CHLORINE : BUCKET WASHING / DISINFECTION": PRINT "******** P
      ROCEDURE IS IMPORTANT ********": PRINT "1 PREPARE CONTAINER OF CHLOR
      INE SOLUTION": PRINT "2 PREPARE NEUTRALIZING TUB  178 MG/L    "
8861  PRINT "  NA2S2O3  (SODIUM THIOSULFATE)": PRINT : PRINT "3 WASH BUCK
      ETS IN CHLORINE SOL.": PRINT : PRINT "4 RINSE IN NEUTRALIZING SOL.":
       PRINT : PRINT "5 RINSE IN WATER (HOSE OFF) & SET TO DRY"
8862  PRINT "6 NEUTRALIZE CHLORINE SOLUTION BEFORE   ": PRINT "  RELEASIN
      G (703 MG NA2S2O3 PER LITER)": RETURN
8870  PRINT "CHLORINE : POND DISINFECTION": PRINT : PRINT "******** PROCE
      DURE IS IMPORTANT ********": PRINT "1 PREPARE CONTAINER OF CHLORINE
      SOLUTION": PRINT "2 SEQUENCE IS IMPORTANT, WAIT 15 MIN.   "
8871  PRINT "3 MIX IN H2SO4.  DO THIS SLOWLY OR       CHLORINE GAS FORMS
      .": PRINT : PRINT "5 ALLOW 10 HOURS FOR DISINFECTION.": PRINT : PRINT
      "6 NEUTRALIZE WITH SODIUM THIOSULFATE    ": PRINT "  (NA2S2O3)   111
      .3 MG / LITER  SOL. ": RETURN
8898  REM
8899  REM  ## ANESTHETIC NOTES ##
8900  PRINT "1 ACTIVE INGREDIENT 100% IN POWDER FORM.  ": PRINT : PRINT "
      2 TEST EACH BATCH FOR FISH TOXICITY     ": PRINT "  BEFORE ALLOWING
      GENERAL HATCHERY USE, ": PRINT "  THERE HAVE BEEN SOME TOXIC LOTS.
          ": PRINT
8901  PRINT "3 IN VERY SOFT WATER SOLUTIONS OF MS-222": PRINT "  MAY REQU
      IRE BUFFERING.  ADJUST TO     ": PRINT "  PH 7.0 USING SODIUM BICARB
      ONATE": PRINT : PRINT "  (BAKING SODA).": PRINT : GOSUB 9200
8902  VTAB 22: PRINT "4 *** ACTUAL AMOUNT NEEDED FOR DESIRED  ": PRINT "
          RESULTS DEPENDS ON WATER TEMP,     ": PRINT "      SPECIES, AGE
      & HEALTH.    ": PRINT : PRINT : RETURN
8910  PRINT : PRINT "1 ACTIVE INGREDIENT 100% IN LIQUID FORM.": PRINT : PRINT
      "2 STANDARD DOSAGE MAY BECOME LETHAL AT  ": PRINT "  HIGHER TEMP. OR
       LARGER FISH SIZES.": PRINT
8911  PRINT : PRINT "3 STORE IN DARK BOTTLES AWAY FROM LIGHT ": PRINT "
      IN A COOL LOCATION.": PRINT : PRINT : PRINT "4 MIX WELL BEFORE USE T
      O AVOID HOT SPOTS": PRINT " OF 2-PHENOXY IN BATH."
8912  GOSUB 9200: VTAB 22: PRINT "5 DOES NOT DISSOLVE WELL IN COLD WATER.
        ": PRINT : PRINT "6 *** ACTUAL AMOUNT NEEDED FOR DESIRED  ": PRINT
      "      RESULTS DEPEND ON WATER TEMP,     ": PRINT "      SPECIES, AGE
       & HEALTH.": PRINT : PRINT : RETURN
8920  PRINT "1 MAINTAIN PH BETWEEN 6.0 - 6.5 WITH      0.122 GM SODIUM BI
      CARBONATE / LITER.  ": PRINT "2 OPT. CO2 CONCENTRATION = 200-400 MG/
      L.": PRINT "3 USE ANHYDROUS CO2 GAS ONLY.": PRINT
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8921  PRINT "4 INTRODUCE CO2 SLOWLY TO MAINTAIN O2     LEVEL ABOVE 6 PPM.
     ": PRINT : PRINT "5 USE A VERY LARGE AIRSTONE AND TURN ON   GAS BEFO
     RE IMMERSING STONE.    ": PRINT
8922  PRINT "6 ADD ADDITIONAL CO2 AS REQUIRED TO        MAINTAIN DESIRED
     DEGREE OF              IMMOBILIZATION.": GOSUB 9200: VTAB 20: PRINT
     "7 RECOMMENDED WHEN FISH ARE FOR HUMAN     CONSUMPTION.": PRINT
8923  PRINT "8 FOR FURTHER INSTRUCTIONS, SEE YOUR      NEIGHBOURHOOD BIOL
     OGIST": PRINT : PRINT : PRINT : RETURN
8999  REM  ## OK (Y/N)
9000  VTAB 23: HTAB 1: PRINT "OK (Y/N)":V = 23:H = 10: GOSUB 9010: RETURN

9010  VTAB V: HTAB H: GET RS$: IF  ASC (RS$) = 18 THEN  RUN
9015  IF  ASC (RS$) = 16 THEN  GOSUB 9050: GOTO 9000
9020  IF RS$ <  > "Y" AND RS$ <  > "N" THEN 9010
9025 RS = 1: IF RS$ = "Y" THEN RS = 2
9030  VTAB 23: HTAB 1: CALL  - 868: POKE  - 16368,0: RETURN
9049  REM  ## SCREEN DUMP ##
9050 Q$ = "": FOR I = 1 TO 42:Q$ = Q$ + "-": NEXT : VTAB 23: HTAB 39: POKE
     33,1: POKE 32,38: POKE 34,23: PR# 1: PRINT " ": PRINT Q$: FOR VV = 1
      TO 23:RS$ = "!"
9060  FOR HH = 1 TO 40:RS$ = RS$ +  CHR$ ( SCRN( HH - 1,2 * (VV - 1)) + 1
     6 *  SCRN( HH - 1,2 * (VV - 1) + 1)): NEXT
9070  PRINT RS$ + "!": NEXT : PRINT Q$: PR# 0: POKE 34,0: POKE 32,0: POKE
     33,40: RETURN
9099  REM   ## SELECT
9100  VTAB V: HTAB 4: PRINT "SELECT ";X$;" #":H = 13 +  LEN (X$): VTAB V:
      HTAB H: POKE 33,38: INPUT "";F$: IF F$ <  > "" THEN  IF  ASC (F$) =
     18 THEN  RUN
9110  IF F$ <  > "" THEN  IF  ASC (F$) = 16 THEN  GOSUB 9050: GOTO 9100
9120 F =  VAL (F$): IF F > U OR F < 1 THEN 9100
9130  POKE 33,40: RETURN
9198  REM
9199  REM  ##  CONTINUE  ##
9200  VTAB 23: HTAB 1: PRINT "(PRESS ANY KEY TO CONTINUE)": VTAB 23: HTAB
     40: GET RS$: IF  ASC (RS$) = 18 THEN  RUN
9210  VTAB 23: HTAB 1: CALL  - 868: IF  ASC (RS$) = 16 THEN  GOSUB 9050: GOTO
     9200
9220  RETURN
9298  REM
9299  REM   ## CHEMICAL NOTES ##
9300  PRINT "GENERAL :": PRINT : PRINT "1 ALWAYS HAVE CALCULATIONS CHECKE
     D BY": PRINT "  A SECOND PERSON.": PRINT : PRINT "2 IF NOT SURE OF F
     ISH REACTION TO A": PRINT "  TREATMENT, TEST A CONTROL GROUP FIRST."

9301  PRINT "3 ALWAYS CONSIDER THE ENVIRONMENTAL ": PRINT "  IMPACT OF TH
     E SPENT CHEMICAL.": PRINT : PRINT "4 ALL CHEMICALS USED TO TREAT FIS
     H": PRINT "  SHOULD BE HANDLED WITH CARE.": PRINT : PRINT "5 USE REC
     OMMENDED CHEMICAL DOSAGES.": RETURN
9310  PRINT "1 KNOWN AS BETADINE OR BRIDINE.": PRINT : PRINT "2 10,000 MG
     /L AVAILABLE IODINE (1% A.I.)": PRINT "3 USE FOR EGG OR EQUIPMENT DI
     SINFECTION.": PRINT : PRINT "4 IF USED TO DISINFECT EGGS, CHECK PH."

9311  PRINT : PRINT "  ADJUST TO 7.0 WITH SODIUM BICARBONATE ": PRINT "
     (BAKING SODA) BEFORE USE.": PRINT : PRINT : PRINT "5 OVADINE AND WES
     CODYNE ARE ALTERNATIVE ": PRINT "  DISINFECTANTS.": RETURN
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9320  PRINT "1  GALLIMYCIN IS A TRADE NAME.": PRINT : PRINT : PRINT "2  U
      SE THE PHOSPHATE FORM OF ERYTHRO.   ": PRINT : PRINT "3  REFRIGERATI
      ON IS PREFERRED BUT IS": PRINT : PRINT "   NOT NECESSARY.  KEEP COOL
       AND DRY.  ": PRINT
9321  PRINT "4  ABSORPTION RATE OF ERYTHROMYCIN      ": PRINT "   PHOSPHA
      TE IS SIGNIFICANTLY INCREASED ": PRINT "   BY SURFACTANTS ADDED TO T
      HE": PRINT : PRINT "   DRUG BATH.": RETURN
9330  PRINT "1 DO NOT USE AT TEMPERATURES ABOVE 18'. ": PRINT "2 IN VERY
      SOFT WATER DO NOT USE AT": PRINT : PRINT "  CONCENTRATIONS > 25 PPM.
      ": PRINT : PRINT "3 HANDLE WITH CARE, FORMALDEHYDE IS": PRINT : PRINT
      "   TOXIC TO HUMANS."
9331  PRINT : PRINT "4 DO NOT ALLOW TO FREEZE.  STORE AT": PRINT : PRINT
      "   ROOM TEMPERATURE.": PRINT : PRINT "5 USE FORMALIN THAT HAS BEEN S
      TABILIZED": PRINT : PRINT "  WITH METHANOL.": GOSUB 9200: VTAB 21: PRINT
      "6 IN EARTHEN PONDS FORMALIN MAY KILL": PRINT :
9332  PRINT "  VEGETATION.": PRINT : PRINT "7 FORMALIN = 37 GM OF FORMALD
      EHYDE GAS": PRINT "    (100%)     DISSOLVED IN 100 ML H2O": PRINT "
              (37% FORMALDEHYDE)": PRINT : PRINT : PRINT : PRINT
9333  RETURN
9340  PRINT "1 THE HIGH PRICE OF FURANACE REQUIRES": PRINT : PRINT "  TRE
      ATMENTS TO BE CARRIED OUT IN AS": PRINT : PRINT "  SMALL A VOLUME OF
       WATER AS POSSIBLE.  ": PRINT : PRINT "2 AUXILIARY AERATION MAY BE N
      ECESSARY."
9341  PRINT : PRINT "3 ALSO KNOWN AS FURPYRIDINOL.": RETURN
9350  PRINT "1 MIX WITH FOOD JUST BEFORE USING": PRINT : PRINT "  ENZYMES
       IN MOIST DIETS RAPIDLY": PRINT : PRINT "  INACTIVATE THE DRUG. ": PRINT
      : PRINT : PRINT "2 HANDLE WITH CARE, DO NOT INHALE DUST"
9351  PRINT : PRINT "  AVOID CONTACT WITH SKIN": PRINT : PRINT "  ALSO KN
      OWN AS NF180, FUROXONE OR       ": PRINT "  NITROFURAN.": RETURN
9360  PRINT "1 IS ERYTHROMYCIN WITH A SUGAR CARRIER. ": PRINT : PRINT "2
      A COMMERCIAL PRODUCT CONTAINING:       ": PRINT "  13 GM WATER SOLUBL
      E ERYTHROMYCIN      ": PRINT "  PHOSPHATE / 100 GRAMS, OR": PRINT
9361  PRINT "  11.56 GRAMS ERYTHROMYCIN / 100 GRAMS. ": PRINT : PRINT "3
      USE 2 PPM FOR 60 MIN WATER HARDENING  ": PRINT "  OF EGGS TO PREVENT
       BKD.": RETURN
9370  PRINT "1 DO NOT USE IN CONTACT WITH ZINC.": PRINT : PRINT "2 USE ZI
      NC - FREE FORM OF THE DYE.": PRINT : PRINT "3 AVOID SKIN CONTACT AND
       DO NOT INHALE. ": PRINT "4 USE WITH EXTREME CAUTION.  TOXIC TO": PRINT

9371  PRINT "  SOME SPECIES AND SIZES OF FISH.       ": PRINT "5 REPORTED
       TO BE CARCINOGENIC. ": PRINT : PRINT : RETURN
9380  PRINT "1 ACTIVE INGREDIENT 1 % (10000 MG/L)    ": PRINT "  AVAILABL
      E IODINE.": PRINT : PRINT : PRINT "2 OVADINE CONTAINS SOME BUFFER, H
      OWEVER ": PRINT "  CHECK PH BEFORE USING.  IF NECESSARY,"
9381  PRINT "  ADJUST PH TO 7.0 USING SODIUM         ": PRINT "  BICARBON
      ATE (BAKING SODA).": RETURN
9390  PRINT "1 IN VERY SOFT WATER USE WITH CAUTION.": PRINT : PRINT : PRINT
      "2 10 PPM IS HIGHLY TOXIC TO SALMONIDS.  ": PRINT
9391  PRINT "3 AVAILABLE AT LOCAL DRUG STORES.       ": PRINT : PRINT "4
      EXPLOSIVE IF BROUGHT INTO CONTACT WITH": PRINT "  READILY OXIDIZABLE
       SUBSTANCES         ": PRINT "  (EG. GLYCEROL).": RETURN
9400  PRINT "1 EXTREMELY TOXIC AT HIGH TEMPERATURES": PRINT : PRINT "  AN
      D LOW WATER HARDNESS.  TEST A       ": PRINT "  CONTROL GROUP FIRST.
      ": PRINT : PRINT : PRINT "2 ALSO KNOWN AS BENZALKONIUM CHLORIDE.  ":
       PRINT
```

```
9401  PRINT "3 RECOMMENDED FOR DISINFECTION OF EQUIP.": PRINT "  NON-CORR
      OSIVE BUT HAS HIGH TOXICITY   ": PRINT "  TO FISH.": PRINT : PRINT :
       PRINT "4 CHECK % ACTIVE INGREDIENT LEVEL.": RETURN
9410  PRINT "1 DO NOT FEED LESS THAN THE RECOMMENDED": PRINT : PRINT "  A
      MOUNT.": PRINT : PRINT : PRINT "2 STABLE FOR 5 - 10 YEARS IF STORED
      IN A": PRINT "  COOL DRY PLACE.": PRINT : PRINT
9411  PRINT "3 SULFAMERAZINE AND SULFAMETHAZINE       ": PRINT "  CAN BE S
      UBSTITUTED FOR EACH OTHER     ": PRINT "  IN MOST CASES.": RETURN
9430  PRINT "1 DRUG RESISTANCE BY BACTERIAL PATHOGEN": PRINT : PRINT "  M
      AY DEVELOP IF USED IMPROPERLY.": PRINT : PRINT "  DO NOT FEED LESS T
      HAN THE RECOMMENDED": PRINT : PRINT "  AMOUNT.": RETURN
9440  PRINT "1 SEE MANUFACTURER'S INSTRUCTIONS FOR": PRINT : PRINT "  APP
      LICATION.": RETURN
9449  REM  ## APPLICATION NOTES
9450  HOME : VTAB 4: PRINT "   DEFINITION OF SELECTED APPLICATION  ": PRINT
      "****************************************": VTAB 9: PRINT AL$(AF);"
      :": PRINT : ON AF GOSUB 9460,9465,9470,9475,9480,9485,9486: RETURN
9460  PRINT "ONE HOUR EXPOSURE TO MODERATE            ": PRINT "CONCENTRAT
      IONS OF CHEMICALS WITH": PRINT : PRINT "INFLOWING WATER.": RETURN
9465  PRINT "ONE HOUR EXPOSURE TO A CHEMICAL WITH THE": PRINT "WATER TURN
      ED OFF.": RETURN
9470  PRINT "EXPOSURE TO LOW CONCENTRATIONS OF        ": PRINT "CHEMICALS
      FOR PROLONGED PERIODS OF TIME ": PRINT "(4 - 12 HOURS)": RETURN
9475  PRINT "A QUICK EXPOSURE TO HIGH CONCENTRATIONS ": PRINT "OF CHEMICA
      LS FOR 1 TO 10 MIN.": RETURN
9480  PRINT "A SINGLE FLUSH THROUGH THE SYSTEM": RETURN
9485  PRINT "DRUGS MIXED WITH FOOD.  THIS TREATMENT  ": PRINT "ASSUMES TH
      AT EACH FISH RECEIVES IT'S     ": PRINT "CALCULATED ALLOTMENT, THEREF
      ORE THE      ": PRINT "POND WEIGHT ESTIMATE MUST BE AS ACCURATE": PRINT
      "AS POSSIBLE.": RETURN
9486  PRINT "ANTIBIOTIC INJECTED INTO THE DORSAL      ": PRINT "SINUS LOCA
      TED CENTER OF THE BACK,        ": PRINT "IMMEDIATELY ANTERIOR TO THE
      DORSAL FIN. ": PRINT "INSERT NEEDLE VERTICALLY.  FOR A 2-LB.  "
9487  PRINT "FISH THE SINUS IS APPROXIMATELY 1 CM     ": PRINT "BELOW THE
      SKIN.": RETURN
9498  REM
9499  REM   ** PRINT STANDARD DOSE **
9500 LD =  LEN (SD$(SD)) / 3 - 1: FOR I = 1 TO LD:L$(I) = "":N$(I) =  MID$
      (SD$(SD),I * 3 + 1,3): NEXT : PRINT "STANDARD DOSE : (ACTIVE INGREDI
      ENT)": PRINT "============": PRINT :X$ = "CONSECUTIVE DAYS":T(1) =
      TF: IF TF > 24 THEN 9550
9510 L$(1) =  MID$ ("PPMPPMPPMPPMPPMGMSMGS",AF * 3 - 2,3): IF MF = 6 AND
      AF = 7 THEN L$(1) = "MGS A.I./ LB FISH"
9520 L$(2) =  MID$ ("DAYMINHRSMIN   DAY   ",AF * 3 - 2,3): IF MF = 6 AND
      AF = 6 THEN L$(2) = X$
9530  IF LD = 3 THEN L$(3) = X$
9540  GOTO 9570
9550 L$(1) = "GMS":L$(2) = "GMS":L$(3) = X$: IF AF = 3 THEN L$(1) = "PPM"
      :L$(2) = "PPM":L$(3) = "HR":L$(4) = X$
9560 X$ = "131723212322152115 22": FOR I = 1 TO 2:T(I) =  VAL ( MID$ (X$,T
      F * 4 - 101 + 2 * I,2)): NEXT
9570  FOR I = 1 TO LD: PRINT "   ";N$(I);" ";L$(I): NEXT
9580  RETURN
9899  REM  ##  LABELS
9900  FOR DF = 1 TO 24: READ DL$(DF): NEXT
9901  FOR TF = 10 TO 29: READ TL$(TF): NEXT
```

```
9902  FOR AF = 0 TO 8: READ AL$(AF): NEXT
9903  FOR SF = 1 TO 4: READ SL$(SF): NEXT
9904  FOR DF = 1 TO 24: FOR SF = 1 TO 4: READ DS$(DF,SF): NEXT : NEXT
9905  FOR SD = 1 TO 28: READ SD$(SD): NEXT
9906  FOR UF = 1 TO 10: READ UL$(UF): NEXT
9907  FOR UF = 1 TO 10: READ UC(UF): NEXT
9908  FOR I = 1 TO 6: READ DIL$(I): NEXT : FOR I = 1 TO 3: READ ANL$(I): NEXT

9909  FOR I = 1 TO 14: READ AI(I): NEXT :PL$(1) = "PREVENTION":PL$(2) = "
      CONTROL":PL$(3) = "PREVENT/CONTROL":CL$(1) = "RECTANGULAR":CL$(2) =
      "CIRCULAR":CL$(3) = "OVAL":CL$(4) = "SLOPE-SIDED RACEWAY": RETURN
9910  DATA BACT GILL DISEASE,BKD,COLDWATER DISEASE,COLUMNARIS DISEASE, CO
      STIA, CRYPTOBIA, ENTERIC REDMOUTH, EPISTYLIS, FUNGUS, FURUNCULOSIS,
      FUSIFORM GILL DISEASE, GLOCHIDIA (CLAM)
9911  DATA GYRODACTYLUS,HEXAMITA,ICH, MOTILE AEROMONAS SEPTICEMIA, MYXOBA
      CTERIAL GILL DISEASE, PSEUDOMONAS INFECTION, SALMONCOLA, SPOROCYTOPH
      AGA, TRICHODINA, TRICHOPHYRA, TUBERCULOSIS,VIBRIOSIS
9920  DATA NONE, BETADINE, ERYTHROMYCIN, FORMALIN, FURANACE, FURAZOLIDONE
      , GALLAMYCIN, MALACHITE, OVADINE, POTASSIUM PERMANGANATE, ROCCAL, SU
      LFAMERAZINE, SULFAMETHAZINE, TERRAMYCIN, VACCINE
9921  DATA FORMALIN-MALACHITE, TERRAMYCIN-SULFAMERAZINE, TERRAMYCIN-SULFA
      METHAZINE, FURAZOLIDONE-SULFAMERAZINE, FURAZOLIDONE-SULFAMETHAZINE
9930  DATA ,1 HR BATH, STATIC BATH, LONG BATH, DIP, FLUSH, ORAL, INJECTED
      , VACCINE
9940  DATA ADULT/FINGERLING, FRY, SAC FRY,EGG
```

Rapport de cas (Case Reporter)

```
90  REM  *** CASE REPORTER  JULY 6,1983 ***
91  REM  *** ANNE KLING ***
100  HOME
110 FS$(1) = "DDMMYY":SM$(2) = "DDMMYY":D$ =  CHR$ (4):FF$ =  CHR$ (12):B
     = 6
120  DIM D0(13),D0$(13),D1(13),D1$(13),D6(13),D6$(13),D7(11),D7$(11),DA(1
     0),DA$(10),DB(14),DB$(14),LO$(7,2),CM$(100),ZL(61),CD$(8)
130  GOSUB 9000: REM * READ DATA *
137  REM
138  REM *** LAYOUT MENU ***
139  REM
140  GOSUB 10000: VTAB 4: PRINT "CHOOSE MENU OPTION # "
145 MX = 7
150  FOR I = 1 TO MX: VTAB (V(I)): HTAB 5: PRINT N(I); SPC( 2);MN$(I): NEXT

160 V = 4:H = 21: GOSUB 21000: GOSUB 24000: GOSUB 23000: IF RS$ = "" THEN
     160
165 RS =  VAL (RS$)
170  VTAB (V(RS)): INVERSE : HTAB 8: PRINT MN$(RS): NORMAL
180  GOSUB 26000: IF RS$ = "N" THEN  VTAB (V(RS)): HTAB 8: PRINT MN$(RS):
      GOTO 160
190  ON RS GOTO 1000,2000,3000,4000,5000,6000,7000
200  GOTO 140
999  REM
1000  REM *** INPUT ROUTINE ***
1001  REM
1010  GOSUB 11000: PRINT : GOSUB 11500
1020  GOSUB 12000: PRINT : GOSUB 12500
1030  GOSUB 13000: PRINT : GOSUB 13500
1040  GOSUB 14000: PRINT : GOSUB 14500
1050  GOSUB 15000: PRINT : GOSUB 15500
1060  GOSUB 16000: PRINT : GOSUB 16500
1070  PRINT : GOSUB 17000
1080  GOTO 140
1999  REM
2000  REM *** REVIEW ROUTINE ***
2001  REM
2010  GOSUB 11000: GOSUB 26000: IF RS$ = "N" THEN  VTAB 10: GOSUB 11500
2020  GOSUB 12000: GOSUB 26000: IF RS$ = "N" THEN  GOSUB 12500
2030  GOSUB 13000: GOSUB 26000: IF RS$ = "N" THEN  GOSUB 13500
2040  GOSUB 14000: GOSUB 26000: IF RS$ = "N" THEN  GOSUB 14500
2050  GOSUB 15000: GOSUB 26000: IF RS$ = "N" THEN  GOSUB 15500
2060  GOSUB 16000: GOSUB 26000: IF RS$ = "N" THEN  GOSUB 16500
2070  GOSUB 10000: HTAB 15: PRINT "COMMENTS": PRINT : PRINT
2080  FOR I = 1 TO N: PRINT CM$(I): NEXT : GOSUB 26000: IF RS$ = "N" THEN
      GOSUB 17000
2090  GOTO 140
2999  REM
3000  REM *** HARD COPY OF REPORT ***
3001  REM
3010  PR# 1: GOSUB 11000: PRINT : PRINT : PRINT : GOSUB 12010: PRINT : PRINT
     : PRINT : GOSUB 13010: PRINT :: PRINT : PRINT : GOSUB 14010: PRINT :
      PRINT : PRINT : GOSUB 15010: PRINT : PRINT : PRINT : GOSUB 16010
```

```
3020  PRINT : PRINT : PRINT : PRINT "COMMENTS": PRINT : PRINT : FOR I = 1
      TO N: PRINT CM$(I): PRINT : NEXT
3030  PR# 0: GOTO 140
3999  REM
4000  REM *** WRITE DATA ROUTINE ***
4001  REM
4010  GOSUB 10000:DS$ = "DS " + FS$(1) + " " + DO$( VAL (FS$(4))) + " " +
      FS$(2)
4020  VTAB 4: PRINT "A FILE CONTAINING ALL THE DATA WILL NOW BE SAVED UND
      ER THE NAME :": PRINT : PRINT : PRINT "*"; LEFT$ (DS$,30);"*"
4030  VTAB 11: PRINT "WILL THIS NAME BE SUFFICIENT FOR        IDENTIFICAT
      ION ? <Y/N>": VTAB 12: HTAB 24: GET RS$: PRINT : IF RS$ <  > "Y" AND
      RS$ <  > "N" THEN 4030
4040  IF RS$ = "Y" THEN DS$ =  LEFT$ (DS$,30): GOTO 4060
4050  PRINT : VTAB 15: PRINT "RENAME THE FILE INCLUDING SPECIES": PRINT "
      NEW NAME MUST BE LESS THEN 30 CHARACTERS": PRINT "NOTE : NAME MUST A
      LSO BE UNIQUE !"
4055  VTAB 20: HTAB 32: PRINT "*": VTAB 20: PRINT "*DS ";FS$(1): VTAB 20:
       HTAB 11: INPUT "";RS$
4056 DS$ = "DS " + FS$(1) + RS$
4057  IF  LEN (DS$) > 30 THEN 4020
4060  PRINT D$;"OPEN ";DS$
4070  PRINT D$;"DELETE ";DS$
4080  PRINT D$;"OPEN ";DS$
4090  PRINT D$;"WRITE ";DS$
4100  PRINT 10000 + N
4110  FOR I = 1 TO 8: PRINT FS$(I): NEXT
4120  FOR I = 1 TO 3: PRINT SM$(I): NEXT
4130  FOR J = 0 TO 1: FOR I = 1 TO 7: PRINT LO$(I,J): NEXT I: NEXT J
4140  FOR I = 1 TO 8: PRINT CD$(I): NEXT
4150  FOR I = 1 TO 5: PRINT DM$(I): NEXT
4160  FOR I = 1 TO 5: PRINT FD$(I): NEXT
4170  FOR I = 1 TO 3: PRINT TM$(I): NEXT
4175  FOR I = 1 TO 6: PRINT DV$(I): NEXT
4180  FOR I = 1 TO 8: PRINT W$(I): NEXT
4185  PRINT  STR$ (PF)
4190  FOR I = 1 TO N: PRINT CM$(I): NEXT
4200  PRINT D$;"CLOSE ";DS$
4210  IF PF = 0 THEN 4310
4220 TT$ =  RIGHT$ (DS$, LEN (DS$) - 2)
4230  PRINT D$;"OPEN XR";TT$
4240  PRINT D$;"DELETE XR";TT$
4250  PRINT D$;"OPEN XR";TT$
4260  PRINT D$;"WRITE XR";TT$
4270  FOR I = 1 TO 8: PRINT XD$(I): NEXT
4280  PRINT D$;"CLOSE XR";TT$
4310  GOTO 140
4999  REM
5000  REM *** RETRIEVE DATA ***
5001  REM
5010  PRINT D$;"CATALOG"
5020  PRINT "ALL DISEASE DATA FILES BEGIN WITH 'DS' ": INPUT "CHOOSE ONE
     ";DS$
5030  PRINT D$;"OPEN ";DS$
5040  PRINT D$;"READ ";DS$
5050  INPUT N:N = N - 10000
```

```
5060  FOR I = 1 TO 8: INPUT FS$(I): NEXT
5070  FOR I = 1 TO 3: INPUT SM$(I): NEXT
5080  FOR J = 0 TO 1: FOR I = 1 TO 7: INPUT LO$(I,J): NEXT I: NEXT J
5090  FOR I = 1 TO 8: INPUT CD$(I): NEXT
5100  FOR I = 1 TO 5: INPUT DM$(I): NEXT
5110  FOR I = 1 TO 5: INPUT FD$(I): NEXT
5120  FOR I = 1 TO 3: INPUT TM$(I): NEXT
5125  FOR I = 1 TO 6: INPUT DV$(I): NEXT
5130  FOR I = 1 TO 8: INPUT W$(I): NEXT
5135  INPUT RS$:PF =  VAL (RS$)
5140  FOR I = 1 TO N: INPUT CM$(I): NEXT
5150  PRINT D$;"CLOSE ";DS$
5160  IF PF = 0 THEN 5300
5170 TT$ =  RIGHT$ (DS$, LEN (DS$) - 2)
5180  PRINT D$;"OPEN XR";TT$
5190  PRINT D$;"READ XR";TT$
5200  FOR I = 1 TO 8: INPUT XD$(I): NEXT
5210  PRINT D$;"CLOSE XR";TT$
5300  GOTO 140
5999  REM
6000  REM *** HARD COPY OF BLANK FORM ***
6001  REM
6010  HOME : VTAB 9: HTAB 18: FLASH : PRINT "WARNING": NORMAL
6020  VTAB 11: HTAB 7: PRINT "THIS OUTPUT ERASES ALL DATA"
6030  VTAB 12: HTAB 5: PRINT "IF YOU WISH TO CONTINUE TYPE <C>": VTAB 12:
      HTAB 38: GET RS$
6040  IF RS$ <  > "C" THEN  GOTO 140
6045 UN$ =  CHR$ (223): FOR I = 1 TO 11:Z$ = Z$ + UN$: NEXT
6050 ZZ$ = "*" + Z$
6052  FOR I = 1 TO 9:FS$(I) = Z$:SM$(I) = Z$:DM$(I) = Z$:FD$(I) = Z$:TM$(
     I) = Z$:DV$(I) = Z$:W$(I) = Z$: NEXT
6053  FOR I = 1 TO 8:CD$(I) = Z$: NEXT
6054 K = 1: FOR I = 1 TO 8: FOR J = 1 TO ZL(K):FS$(I) = FS$(I) + UN$: NEXT
     :K = K + 1: NEXT
6056  FOR I = 1 TO 3: FOR J = 1 TO ZL(K):SM$(I) = SM$(I) + UN$: NEXT :K =
     K + 1: NEXT
6058  FOR I = 1 TO 10:LO$ = LO$ + UN$: NEXT
6059  FOR I = 1 TO 7:LO$(I,0) = LO$:LO$(I,1) = LO$: NEXT
6060  FOR I = 1 TO 8: FOR J = 1 TO ZL(K):CD$(I) = CD$(I) + UN$: NEXT :K =
     K + 1: NEXT
6062  FOR I = 1 TO 5: FOR J = 1 TO ZL(K):DM$(I) = DM$(I) + UN$: NEXT :K =
     K + 1: NEXT
6064  FOR I = 1 TO 5: FOR J = 1 TO ZL(K):FD$(I) = FD$(I) + UN$: NEXT :K =
     K + 1: NEXT
6065  FOR I = 1 TO 6: FOR J = 1 TO ZL(K):DV$(I) = DV$(I) + UN$: NEXT :K =
     K + 1: NEXT
6066  FOR I = 1 TO 8: FOR J = 1 TO ZL(K):W$(I) = W$(I) + UN$: NEXT :K = K
      + 1: NEXT
6068  FOR I = 1 TO 8:CD$ = CD$ + UN$: NEXT :CD$(3) = CD$:CD$(6) = CD$
6070 D0$(0) = ZZ$:D1$(0) = ZZ$:D2$(0) = ZZ$:D3$(0) = ZZ$
6072 D4$(0) = ZZ$:D5$(0) = ZZ$:D6$(0) = ZZ$:D7$(0) = ZZ$
6074 D8$(0) = ZZ$:D8$(0) = ZZ$:D9$(0) = ZZ$:DA$(0) = ZZ$
6076 DB$(0) = ZZ$:DC$(0) = ZZ$:DD$(0) = ZZ$:DE$(0) = ZZ$:DF$(0) = ZZ$
6078  FOR I = 1 TO ZL(K):D0$(0) = D0$(0) + UN$: NEXT :K = K + 1: FOR I =
     1 TO ZL(K):D1$(0) = D1$(0) + UN$: NEXT :K = K + 1
```

```
6080  FOR I = 1 TO ZL(K):D2$(0) = D2$(0) + UN$: NEXT :K = K + 1: FOR I =
      1 TO ZL(K):D3$(0) = D3$(0) + UN$: NEXT :K = K + 1
6081  FOR I = 1 TO ZL(K):D4$(0) = D4$(0) + UN$: NEXT :K = K + 1: FOR I =
      1 TO ZL(K):D5$(0) = D5$(0) + UN$: NEXT :K = K + 1
6082  FOR I = 1 TO ZL(K):D6$(0) = D6$(0) + UN$: NEXT :K = K + 1: FOR I =
      1 TO ZL(K):D7$(0) = D7$(0) + UN$: NEXT :K = K + 1
6084  FOR I = 1 TO ZL(K):D8$(0) = D8$(0) + UN$: NEXT :K = K + 1: FOR I =
      1 TO ZL(K):D9$(0) = D9$(0) + UN$: NEXT :K = K + 1
6086  FOR I = 1 TO ZL(K):DA$(0) = DA$(0) + UN$: NEXT :K = K + 1: FOR I =
      1 TO ZL(K):DB$(0) = DB$(0) + UN$: NEXT :K = K + 1
6088  FOR I = 1 TO ZL(K):DC$(0) = DC$(0) + UN$: NEXT :K = K + 1: FOR I =
      1 TO ZL(K):DD$(0) = DD$(0) + UN$: NEXT :K = K + 1
6090  FOR I = 1 TO ZL(K):DE$(0) = DE$(0) + UN$: NEXT :K = K + 1: FOR I =
      1 TO ZL(K):DF$(0) = DF$(0) + UN$: NEXT
6130  PR# 1: PRINT  CHR$ (9);"10L"
6140  PRINT  CHR$ (9);"10L"
6170  GOSUB 11000: PRINT : PRINT : GOSUB 12010
6180  PRINT : PRINT : PRINT "SPECIES OPTIONS"; SPC( 10);"AGE OPTIONS"; SPC(
      10);"SEX OPTIONS": PRINT
6190  FOR I = 1 TO 4: PRINT D0$(I); SPC( 25 -  LEN (D0$(I)));D1$(I); SPC(
      2% -  LEN (D1$(I)));D2$(I): NEXT
6200  FOR I = 5 TO 13: PRINT D0$(I); SPC( 25 -  LEN (D0$(I)));D1$(I): NEXT

6220  PRINT : PRINT : PRINT "SUBMISSION REASONS"; SPC( 7);"STOCK ORIGIN":
      PRINT
6230  FOR I = 1 TO 6: PRINT D3$(I); SPC( 25 -  LEN (D3$(I)));D4$(I): NEXT

6240  PRINT D$;FF$
6250  GOSUB 13000: PRINT : PRINT : GOSUB 14010
6260  PRINT : PRINT : PRINT "SAMPLE TYPE"; SPC( 14);"CONTAINER TYPE": PRINT

6270  FOR I = 1 TO 6: PRINT D5$(I); SPC( 25 -  LEN (D5$(I)));D6$(I): NEXT

6280  FOR I = 7 TO 13: PRINT  TAB( 26);D6$(I): NEXT
6290  PRINT : PRINT : PRINT "DIET"; SPC( 21);"DIET TYPE"; SPC( 12);"FEEDI
      NG METHOD": PRINT
6300  FOR I = 1 TO 3: PRINT D7$(I); SPC( 25 -  LEN (D7$(I)));D8$(I); SPC(
      21 -  LEN (D8$(I)));D9$(I): NEXT
6310  FOR I = 4 TO 11: PRINT D7$(I): NEXT
6320  PRINT D$;FF$
6330  GOSUB 15000: PRINT : PRINT "FOR PREVIOUS DIAGNOSIS, PREVIOUS MEDICA
      TION AND": PRINT "VACCINATION FILL IN DATES IF DONE": PRINT : PRINT
      : GOSUB 16010
6340  PRINT : PRINT : PRINT "BEHAVIOR"; SPC( 11);"GROSS SIGNS"; SPC( 10);
      "RECENT HANDLING": PRINT
6350  FOR I = 1 TO 7: PRINT DA$(I); SPC( 19 -  LEN (DA$(I)));DB$(I); SPC(
      21 -  LEN (DB$(I)));DC$(I): NEXT
6360  FOR I = 8 TO 14: PRINT  SPC( 19);DB$(I): NEXT
6370  PRINT : PRINT : PRINT "WATER SOURCE       WATER HARDNESS": PRINT
6380  FOR I = 1 TO 7: PRINT DE$(I); SPC( 19 -  LEN (DE$(I)));DF$(I): NEXT
6390  PRINT D$;FF$
6400  PRINT : PRINT "COMMENTS"
6410  FOR I = 1 TO 10: PRINT : PRINT : PRINT : FOR J = 1 TO 6: PRINT Z$;:
      NEXT : NEXT
6420  PR# 0
6430  PRINT : RUN
```

```
6999  REM
7000  REM *** GO TO DISEASE MENU ***
7001  REM
7010  PRINT D$;"RUN FISH HEALTH"
8997  REM
8998  REM *** READ DATA AT END ***
8999  REM
9000  FOR I = 1 TO 13: READ D0(I),D0$(I): NEXT
9010  FOR I = 1 TO 13: READ D1(I),D1$(I): NEXT
9020  FOR I = 1 TO 4: READ D2(I),D2$(I): NEXT
9030  FOR I = 1 TO 6: READ D3(I),D3$(I): NEXT
9040  FOR I = 1 TO 4: READ D4(I),D4$(I): NEXT
9050  FOR I = 1 TO 6: READ D5(I),D5$(I): NEXT
9060  FOR I = 1 TO 13: READ D6(I),D6$(I): NEXT
9070  FOR I = 1 TO 11: READ D7(I),D7$(I): NEXT
9080  FOR I = 1 TO 3: READ D8(I),D8$(I): NEXT
9090  FOR I = 1 TO 3: READ D9(I),D9$(I): NEXT
9100  FOR I = 1 TO 10: READ DA(I),DA$(I): NEXT
9110  FOR I = 1 TO 14: READ DB(I),DB$(I): NEXT
9120  FOR I = 1 TO 6: READ DC(I),DC$(I): NEXT
9130  FOR I = 1 TO 2: READ DD(I),DD$(I): NEXT
9140  FOR I = 1 TO 7: READ DE(I),DE$(I): NEXT
9150  FOR I = 1 TO 7: READ DF(I),DF$(I): NEXT
9160  FOR I = 1 TO 7: READ V(I),N(I),MN$(I): NEXT
9165  FOR I = 1 TO 59: READ ZL(I): NEXT
9170  RETURN
9997  REM
9998  REM *** TITLE ***
9999  REM
10000  HOME : VTAB 1: HTAB 14: PRINT "CASE REPORTER"
10010  VTAB 2: HTAB 14: PRINT "=============="
10020  RETURN
10997  REM
10998  REM *** PRINT PAGE ONE ***
10999  REM
11000  GOSUB 10000
11010  VTAB 4: HTAB 1: PRINT "DATE : ";FS$(1)
11020  VTAB 6: PRINT "SAMPLE SITE : ";FS$(2)
11030  VTAB 8: PRINT "CONTRIBUTOR : ";FS$(3)
11040  VTAB 10: PRINT "SPECIES : ";D0$( VAL (FS$(4)))
11045  IF PF = 1 AND FS$(4) = "13" THEN  VTAB 10: HTAB 11: CALL  - 868: VTAB
     10: HTAB 11: PRINT XD$(1)
11050  VTAB 12: PRINT "AGE : ";D1$( VAL (FS$(5)))
11055  IF PF = 1 AND FS$(5) = "13" THEN  VTAB 12: HTAB 7: CALL  - 868: VTAB
     12: HTAB 7: PRINT XD$(2)
11060  VTAB 14: PRINT "LENGTH (MM) : ";FS$(6)
11070  VTAB 16: PRINT "WEIGHT (GM) : ";FS$(7)
11080  VTAB 18: PRINT "SEX : ";D2$( VAL (FS$(8)))
11090  RETURN
11497  REM
11498  REM *** INPUT PAGE ONE ***
11499  REM
11500 V = 4:H = 7:B = 6:RS$ = FS$(1): GOSUB 21000: GOSUB 22000: GOSUB 250
     00:FS$(1) = RS$: GOSUB 28000
11510 V = 6:H = 14:RS$ = FS$(2): GOSUB 21000:FS$(2) = RS$: GOSUB 28000
11520 V = 8:H = 14:RS$ = FS$(3): GOSUB 21000:FS$(3) = RS$: GOSUB 28000
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11530 MN = 1:MX = 13:V = 10: FOR I = 1 TO MX: VTAB V + I: HTAB 21: PRINT
     D0(I); SPC( 3 -  LEN ( STR$ (D0(I))));D0$(I): NEXT
11540 V = 10:H = 10:RS$ = FS$(4): GOSUB 21000: GOSUB 23000:FS$(4) = RS$:R
     S$ = D0$( VAL (FS$(4))): GOSUB 28000
11542 RR$ = FS$(4):XC = 1: GOSUB 31000: GOSUB 28000
11550 V = 11:H = 21:BL = MX: GOSUB 27000
11560 V = 10:MX = 13: FOR I = 1 TO MX: VTAB V + I: HTAB 23: PRINT " ";D1(
     I); SPC( 3 -  LEN ( STR$ (D1(I))));D1$(I): NEXT
11570 V = 12:H = 6:RS$ = FS$(5): GOSUB 21000: GOSUB 23000:FS$(5) = RS$:RS
     $ = D1$( VAL (FS$(5))): GOSUB 28000
11572 RR$ = FS$(5):XC = 2: GOSUB 31000: GOSUB 28000
11580 V = 11:H = 24:BL = MX: GOSUB 27000
11585 V = 12:H = 6: GOSUB 28000
11590 V = 14:H = 14:RS$ = FS$(6): GOSUB 21000:FS$(6) = RS$: GOSUB 28000
11600 V = 16:H = 14:RS$ = FS$(7): GOSUB 21000:FS$(7) = RS$: GOSUB 28000
11610 V = 19:MN = 1:MX = 4: FOR I = 1 TO MX: VTAB V: HTAB 24: PRINT D2(I)
     ;" ";D2$(I):V = V + 1: NEXT
11620 V = 18:H = 6:RS$ = FS$(8): GOSUB 21000: GOSUB 23000:FS$(8) = RS$:RS
     $ = D2$( VAL (FS$(8))): GOSUB 28000
11630 V = 19:H = 24:BL = MX: GOSUB 27000
11640  GOSUB 26000: IF RS$ = "N" THEN 1010
11650  RETURN
11997  REM
11998  REM *** PRINT PAGE TWO ***
11999  REM
12000  GOSUB 10000
12010  VTAB 4: PRINT "REASON FOR SUBMISSION: ";D3$( VAL (SM$(1)))
12015  IF PF = 1 AND SM$(1) = "6" THEN  VTAB 4: HTAB 24: CALL  - 868: VTAB
     4: HTAB 24: PRINT XD$(3)
12020  VTAB 6: PRINT "DATE COLLECTED : ";SM$(2)
12030  VTAB 8: PRINT "STOCK ORIGIN : ";D4$( VAL (SM$(3)))
12040  VTAB 10: PRINT  TAB( 16);"LOSSES    WATER TEMP 'C"
12050  VTAB 11: PRINT "TODAY'S   (7)  ";LO$(1,0); SPC( 11 -  LEN (LO$(1,0
     )));LO$(1,1)
12060  VTAB 12: PRINT "PAST WEEK (6)  ";LO$(2,0); SPC( 11 -  LEN (LO$(2,0
     )));LO$(2,1)
12070 V = 13:J = 5: FOR I = 3 TO 7: VTAB V: PRINT "          (";J;")  ";L
    O$(I,0); SPC( 11 -  LEN (LO$(I,0)));LO$(I,1):V = V + 1:J = J - 1: NEXT
12080  RETURN
12497  REM
12498  REM *** INPUT PAGE TWO ***
12499  REM
12500 V = 19: FOR I = 1 TO 3: VTAB V: HTAB 1: PRINT D3(I);" ";D3$(I):V =
     V + 1: NEXT
12510 V = 19: FOR I = 4 TO 6: VTAB V: HTAB 25: PRINT D3(I);" ";D3$(I):V =
     V + 1: NEXT
12520 V = 4:H = 23:MX = 6:RS$ = SM$(1): GOSUB 21000: GOSUB 23000:SM$(1) =
    RS$:RS$ = D3$( VAL (SM$(1))): GOSUB 28000
12522 RR$ = SM$(1):XC = 3: GOSUB 31000: GOSUB 28000
12530 V = 19:BL = 3:H = 1: GOSUB 27000
12540 V = 6:H = 17:RS$ = SM$(2): GOSUB 21000: GOSUB 22000: GOSUB 25000:SM
     $(2) = RS$: GOSUB 28000
12550 V = 19: FOR I = 1 TO 4: VTAB V: HTAB 15: PRINT D4(I);" ";D4$(I):V =
     V + 1: NEXT
12560 V = 8:H = 15:MX = 4:RS$ = SM$(3): GOSUB 21000: GOSUB 23000:SM$(3) =
     RS$:RS$ = D4$( VAL (SM$(3))): GOSUB 28000
```

```
12570 V = 19:BL = 4:H = 1: GOSUB 27000
12580 V = 11: FOR I = 1 TO 7:H = 15:RS$ = LO$(I,0): GOSUB 29000:LO$(I,0) =
     RS$:H = 26:RS$ = LO$(I,1): GOSUB 29000:LO$(I,1) = RS$:V = V + 1: NEXT

12590  GOSUB 26000: IF RS$ = "N" THEN 1020
12600  RETURN
12997  REM
12998  REM *** PRINT PAGE THREE ***
12999  REM
13000  GOSUB 10000
13010  VTAB 4: PRINT "SAMPLE SIZE : ";CD$(1)
13020  VTAB 5: PRINT "SAMPLE TYPE : ";D5$( VAL (CD$(2)))
13025  IF PF = 1 AND CD$(2) = "6" THEN  VTAB 5: HTAB 15: CALL  - 868: VTAB
     5: HTAB 15: PRINT XD$(4)
13030  VTAB 7: PRINT "NO. AFFECTED CONTAINERS : ";CD$(3)
13040  VTAB 9: PRINT "CONTAINER I.D. : ";CD$(4)
13050  VTAB 10: PRINT "CONTAINER TYPE : ";D6$( VAL (CD$(5)))
13055  IF PF = 1 AND CD$(5) = "13" THEN  VTAB 10: HTAB 18: CALL  - 868: VTAB
     10: HTAB 18: PRINT XD$(5)
13060  VTAB 11: PRINT  TAB( 2)"SIZE    WIDTH : ";DM$(1)
13080  VTAB 12: PRINT  TAB( 9)"LENGTH : ";DM$(2)
13090  VTAB 13: PRINT  TAB( 10)"DEPTH : ";DM$(3)
13100  VTAB 14: PRINT  TAB( 7)"DIAMETER : ";DM$(4)
13110  VTAB 15: PRINT  TAB( 8);"UNKNOWN : ";DM$(5)
13120  VTAB 17: PRINT "  LOAD (FISH/CONTAINER) : ";CD$(6)
13130  VTAB 18: PRINT "  POND INFLOW : ";CD$(7)
13135  VTAB 19: PRINT "  POND VELOCITY : ";CD$(8)
13140  RETURN
13497  REM
13498  REM *** INPUT PAGE THREE ***
13499  REM
13500 V = 4:H = 14:RS$ = CD$(1): GOSUB 21000: GOSUB 24000:CD$(1) = RS$: GOSUB
     28000
13510  VTAB 19: CALL  - 868:V = 19: FOR I = 1 TO 3: VTAB V: HTAB 5: PRINT
     D5(I);" ";D5$(I): VTAB V: HTAB 25: PRINT D5(I + 3);" ";D5$(I + 3):V =
     V + 1: NEXT
13520 V = 5:H = 14:MX = 6:RS$ = CD$(2): GOSUB 21000: GOSUB 23000:CD$(2) =
     RS$:RS$ = D5$( VAL (CD$(2))): GOSUB 28000
13522 RR$ = CD$(2):XC = 4: GOSUB 31000: GOSUB 28000
13530 V = 19:BL = 3:H = 5: GOSUB 27000
13532  VTAB 19: HTAB 2: PRINT "POND VELOCITY : ";CD$(8)
13540 V = 7:H = 26:RS$ = CD$(3): GOSUB 21000: GOSUB 24000:CD$(3) = RS$: GOSUB
     28000
13550 V = 9:H = 17:RS$ = CD$(4): GOSUB 21000:CD$(4) = RS$: GOSUB 28000
13555 V = 17:BL = 6:H = 1: GOSUB 27000
13560 V = 16:MX = 13: FOR I = 1 TO 6: VTAB V + I: HTAB 1: PRINT D6(I); SPC(
     3 -  LEN ( STR$ (D6(I))));D6$(I);: HTAB 16: PRINT D6(I + 6); SPC( 3 -
      LEN ( STR$ (D6(I + 6))));D6$(I + 6): NEXT
13570  VTAB 22: HTAB 30: PRINT D6(13);" ";D6$(13);
13580 V = 10:H = 17:RS$ = CD$(5): GOSUB 21000: GOSUB 23000:CD$(5) = RS$:R
     S$ = D6$( VAL (CD$(5))): GOSUB 28000
13582 RR$ = CD$(5):XC = 5: GOSUB 31000: GOSUB 28000
13590 V = 17:BL = 6:H = 1: GOSUB 27000
13591  VTAB 17: HTAB 2: PRINT "LOAD (FISH/CONTAINER) : ";CD$(6)
13592  VTAB 18: HTAB 2: PRINT "POND INFLOW : ";CD$(7)
13594  VTAB 19: HTAB 2: PRINT "POND VELOCITY : ";CD$(8)
```

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13600 V = 11:H = 17: FOR I = 1 TO 5:RS$ = DM$(I): GOSUB 21000
13610 DM$(I) = RS$: GOSUB 28000:V = V + 1: NEXT
13630 V = 17:H = 25:RS$ = CD$(6): GOSUB 21000:CD$(6) = RS$: GOSUB 28000
13640 V = 18:H = 15:RS$ = CD$(7): GOSUB 21000:CD$(7) = RS$: GOSUB 28000
13655 V = 19:H = 17:RS$ = CD$(8): GOSUB 21000:CD$(8) = RS$: GOSUB 28000
13670  GOSUB 26000: IF RS$ = "N" THEN 1030
13680  RETURN
13997  REM
13998  REM *** PRINT PAGE FOUR ***
13999  REM
14000  GOSUB 10000
14010  VTAB 4: PRINT "DIET : ";D7$( VAL (FD$(1)))
14015  IF PF = 1 AND FD$(1) = "11" THEN  VTAB 4: HTAB 8: CALL  - 868: VTAB
    4: HTAB 8: PRINT XD$(6)
14020  VTAB 5: PRINT "DIET TYPE : ";D8$( VAL (FD$(2)))
14030  VTAB 7: PRINT "FEED RATE : ";FD$(3)
14040  VTAB 8: PRINT " (% OF BODY WEIGHT) "
14050  VTAB 10: PRINT "FEEDING METHOD : ";D9$( VAL (FD$(4)))
14060  VTAB 12: PRINT "PELLET SIZE : ";FD$(5)
14070  RETURN
14497  REM
14498  REM *** INPUT PAGE FOUR ***
14499  REM
14500 MX = 11:V = 15: FOR I = 1 TO 5: VTAB V: HTAB 5: PRINT D7(I); SPC( 3
     -  LEN ( STR$ (D7(I))));D7$(I): VTAB V: HTAB 20: PRINT D7(I + 5); SPC(
    3 -  LEN ( STR$ (D7(I + 5))));D7$(I + 5):V = V + 1: NEXT
14510  VTAB V: HTAB 20: PRINT D7(11);" ";D7$(11)
14520 V = 4:H = 7:RS$ = FD$(1): GOSUB 21000: GOSUB 23000:FD$(1) = RS$:RS$
     = D7$( VAL (FD$(1))): GOSUB 28000
14522 RR$ = FD$(1):XC = 6: GOSUB 31000: GOSUB 28000
14530 V = 15:BL = 6:H = 5: GOSUB 27000
14540 V = 12:MX = 3: FOR I = 1 TO MX: VTAB V: HTAB 25: PRINT D8(I);" ";D8
    $(I):V = V + 1: NEXT
14550 V = 5:H = 12:RS$ = FD$(2): GOSUB 21000: GOSUB 23000:FD$(2) = RS$:RS
    $ = D8$( VAL (FD$(2))): GOSUB 28000
14560 V = 12:BL = MX:H = 25: GOSUB 27000
14570 V = 7:H = 12:RS$ = FD$(3): GOSUB 21000:FD$(3) = RS$: GOSUB 28000
14580 V = 12: FOR I = 1 TO MX: VTAB V: HTAB 25: PRINT D9(I);" ";D9$(I):V =
    V + 1: NEXT
14590 V = 10:H = 17:RS$ = FD$(4): GOSUB 21000: GOSUB 23000:FD$(4) = RS$:R
    S$ = D9$( VAL (FD$(4))): GOSUB 28000
14600 V = 12:H = 25:BL = MX: GOSUB 27000
14610 V = 12:H = 14:RS$ = FD$(5): GOSUB 21000:FD$(5) = RS$: GOSUB 28000
14620  GOSUB 26000: IF RS$ = "N" THEN 1040
14630  RETURN
14997  REM
14998  REM *** PRINT PAGE FIVE ***
14999  REM
15000  GOSUB 10000
15010  VTAB 4: HTAB 1: PRINT "BEHAVIOR : ";DA$( VAL (TM$(1)))
15015  IF PF = 1 AND TM$(1) = "10" THEN  VTAB 4: HTAB 12: CALL  - 868: VTAB
    4: HTAB 12: PRINT XD$(7)
15020  VTAB 6: PRINT "GROSS SIGNS : ";DB$( VAL (TM$(2)))
15025  IF PF = 1 AND TM$(2) = "14" THEN  VTAB 6: HTAB 15: CALL  - 868: VTAB
    6: HTAB 15: PRINT XD$(8)
15030  VTAB 8: PRINT "RECENT HANDLING : ";DC$( VAL (TM$(3)))
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15040  VTAB 10: PRINT "PREVIOUS DIAGNOSIS : ";DV$(1)
15045  IF  LEN (DV$(1)) = 6 OR  LEFT$ (DV$(2),1) =  CHR$ (223) THEN  GOTO
     15055
15050  VTAB 11: HTAB 10: PRINT "(IF ANY)": GOTO 15060
15055  VTAB 11: PRINT "     DIAGNOSTICIAN : ";DV$(2)
15056  VTAB 12: PRINT "          DIAGNOSIS : ";DV$(6)
15060  VTAB 14: PRINT "PREVIOUS MEDICATION : ";DV$(3)
15065  IF  LEN (DV$(3)) = 6 OR  LEFT$ (DV$(4),1) =  CHR$ (223) THEN 15075

15070  VTAB 15: HTAB 10: PRINT "(IF ANY)"
15075  IF  LEN (DV$(3)) = 6 OR  LEFT$ (DV$(4),1) = "." THEN  VTAB 15: PRINT
     "                TYPE : ";DV$(4)
15080  VTAB 17: PRINT "VACCINATION : ";DV$(5)
15090  RETURN
15497  REM
15498  REM *** INPUT PAGE FIVE ***
15499  REM
15500 V = 18: FOR I = 1 TO 5: VTAB V: HTAB 5: PRINT DA(I); SPC( 3 -  LEN
     ( STR$ (DA(I))));DA$(I);: HTAB 25: PRINT DA(I + 5); SPC( 3 -  LEN ( STR$
     (DA(I + 5))));DA$(I + 5):V = V + 1: NEXT
15510 V = 4:H = 11:MX = 10:RS$ = TM$(1): GOSUB 21000: GOSUB 23000:TM$(1) =
     RS$:RS$ = DA$( VAL (TM$(1))): GOSUB 28000
15512 RR$ = TM$(1):XC = 7: GOSUB 31000: GOSUB 28000
15520 V = 17:BL = 6:H = 1: GOSUB 27000
15530 V = 16:BL = 1:H = 1: GOSUB 27000:V = 16: FOR I = 1 TO 7: VTAB V: HTAB
     1: PRINT DB(I); SPC( 3 -  LEN ( STR$ (DB(I))));DB$(I);: HTAB 24: PRINT
     DB(I + 7); SPC( 3 -  LEN ( STR$ (DB(I + 7))));DB$(I + 7):V = V + 1: NEXT

15540 V = 6:H = 14:MX = 14:RS$ = TM$(2): GOSUB 21000: GOSUB 23000:TM$(2) =
     RS$:RS$ = DB$( VAL (TM$(2))): GOSUB 28000
15542 RR$ = TM$(2):XC = 8: GOSUB 31000: GOSUB 28000
15550 V = 16:BL = 7:H = 1: GOSUB 27000: VTAB 17: PRINT "VACCINATION : ";D
     V$(5)
15560 V = 19: FOR I = 1 TO 3: VTAB V: HTAB 8: PRINT DC(I); SPC( 3 -  LEN
     ( STR$ (DC(I))));DC$(I);: HTAB 22: PRINT DC(I + 3); SPC( 3 -  LEN ( STR$
     (DC(I + 3))));DC$(I + 3):V = V + 1: NEXT
15570 V = 8:H = 18:MX = 6:RS$ = TM$(3): GOSUB 21000: GOSUB 23000:TM$(3) =
     RS$:RS$ = DC$( VAL (TM$(3))): GOSUB 28000
15580 V = 19:BL = 3:H = 1: GOSUB 27000
15590 V = 19: FOR I = 1 TO 2: VTAB V: HTAB 20: PRINT DD(I); SPC( 3 -  LEN
     ( STR$ (DD(I))));DD$(I):V = V + 1: NEXT
15592 V = 10:H = 21:MX = 2: IF  LEN (DV$(1)) = 6 THEN MX = 999999
15594 RS$ = DV$(1): GOSUB 21000: GOSUB 23000:DV$(1) = RS$: IF RS$ = "1" THEN
     RS$ = "DDMMYY": GOSUB 28000: VTAB 11: PRINT "     DIAGNOSTICIAN : ";
     DV$(2): VTAB 12: PRINT "          DIAGNOSIS : ";DV$(6)
15596  IF RS$ = "2" THEN RS$ = "NO": GOSUB 28000:DV$(1) = RS$
15598 V = 19:BL = 2:H = 20: GOSUB 27000
15600 V = 10:H = 21: IF RS$ = "DDMMYY" THEN  GOSUB 21000:B = 6: GOSUB 220
     00
15602  IF  LEN (RS$) = 6 THEN  GOSUB 25000:DV$(1) = RS$: GOSUB 28000:V =
     11:H = 21:RS$ = DV$(2): GOSUB 21000:DV$(2) = RS$: GOSUB 28000
15604  IF  LEN (DV$(1)) = 6 THEN V = 12:H = 21:RS$ = DV$(6): GOSUB 21000:
     DV$(6) = RS$: GOSUB 28000
15620 V = 19: FOR I = 1 TO 2: VTAB V: HTAB 20: PRINT DD(I); SPC( 3 -  LEN
     ( STR$ (DD(I))));DD$(I):V = V + 1: NEXT
15622 V = 14:H = 22:MX = 2: IF  LEN (DV$(3)) = 6 THEN MX = 999999
```

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15624 RS$ = DV$(3): GOSUB 21000: GOSUB 23000:DV$(3) = RS$: IF RS$ = "1" THEN
     RS$ = "DDMMYY": GOSUB 28000: VTAB 15: PRINT "                TYPE : "
     ;DV$(4)
15626  IF RS$ = "2" THEN RS$ = "NO": GOSUB 28000:DV$(3) = RS$
15628 V = 19:BL = 2:H = 20: GOSUB 27000
15630 V = 14:H = 22: IF RS$ = "DDMMYY" THEN  GOSUB 21000:B = 6: GOSUB 220
     00
15632  IF  LEN (RS$) = 6 THEN  GOSUB 25000:DV$(3) = RS$: GOSUB 28000:V =
     15:H = 22:RS$ = DV$(4): GOSUB 21000:DV$(4) = RS$: GOSUB 28000
15666 V = 19: FOR I = 1 TO 2: VTAB V: HTAB 20: PRINT DD(I); SPC( 3 -  LEN
     ( STR$ (DD(I)));DD$(I):V = V + 1: NEXT
15668 V = 17:H = 14:MX = 2: IF  LEN (DV$(5)) = 6 THEN MX = 999999
15670 RS$ = DV$(5): GOSUB 21000: GOSUB 23000:DV$(5) = RS$: IF RS$ = "1" THEN
     RS$ = "DDMMYY": GOSUB 28000
15672  IF RS$ = "2" THEN RS$ = "NO": GOSUB 28000:DV$(5) = RS$
15674 V = 19:BL = 2:H = 20: GOSUB 27000
15676 V = 17:H = 14: IF RS$ = "DDMMYY" THEN  GOSUB 21000:B = 6: GOSUB 220
     00
15678  IF  LEN (RS$) = 6 THEN  GOSUB 25000:DV$(5) = RS$: GOSUB 28000
15680 V = 19:BL = 2:H = 20: GOSUB 27000
15690  GOSUB 26000: IF RS$ = "N" THEN 1050
15700  RETURN
15997  REM
15998  REM *** PRINT PAGE SIX ***
15999  REM
16000  GOSUB 10000
16010  VTAB 4: PRINT "WATER SOURCE : ";DE$( VAL (W$(1)))
16020  VTAB 6: PRINT "SALINITY : ";W$(2)
16030  VTAB 8: PRINT "DISSOLVED OXYGEN :  IN : ";W$(3)
16040  VTAB 9: PRINT "                    OUT : ";W$(4)
16050  VTAB 11: PRINT "TGP : ";W$(5)
16060  VTAB 13: PRINT "HARDNESS : ";DF$( VAL (W$(6)))
16070  VTAB 15: PRINT "PH : ";W$(7)
16080  VTAB 17: PRINT "NH3 : ";W$(8)
16090  RETURN
16497  REM
16498  REM *** INPUT PAGE SIX ***
16499  REM
16500 V = 19: FOR I = 1 TO 4: VTAB V: PRINT DE(I);" ";DE$(I);: IF I = 4 THEN
     16520
16510  HTAB 20: PRINT DE(I + 4);" ";DE$(I + 4):V = V + 1: NEXT
16520 MX = 7:V = 4:H = 15:RS$ = W$(1): GOSUB 21000: GOSUB 23000:W$(1) = R
     S$:RS$ = DE$( VAL (W$(1))): GOSUB 28000
16530 V = 19:H = 1:BL = 4: GOSUB 27000
16540 V = 6:H = 11:RS$ = W$(2): GOSUB 21000:W$(2) = RS$: GOSUB 28000
16550 V = 8:H = 25:RS$ = W$(3): GOSUB 21000:W$(3) = RS$: GOSUB 28000
16560 V = 9:H = 25:RS$ = W$(4): GOSUB 21000:W$(4) = RS$: GOSUB 28000
16570 V = 11:H = 6:RS$ = W$(5): GOSUB 21000:W$(5) = RS$: GOSUB 28000
16580 V = 19: FOR I = 1 TO 4: VTAB V: PRINT DF(I);" ";DF$(I);: IF I = 4 THEN
     16600
16590  HTAB 20: PRINT DF(I + 4);" ";DF$(I + 4):V = V + 1: NEXT
16600 MX = 7:V = 13:H = 11:RS$ = W$(6): GOSUB 21000: GOSUB 23000:W$(6) =
     RS$:RS$ = DF$( VAL (W$(6))): GOSUB 28000
16610 V = 19:H = 1:BL = 4: GOSUB 27000
16620 V = 15:H = 5:RS$ = W$(7): GOSUB 21000:W$(7) = RS$: GOSUB 28000
16630 V = 17:H = 6:RS$ = W$(8): GOSUB 21000:W$(8) = RS$: GOSUB 28000
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16640  GOSUB 26000: IF RS$ = "N" THEN 1060
16650  RETURN
16999  REM
17000  REM *** INPUT COMMENTS ***
17001  REM
17010  GOSUB 10000
17020  PRINT : PRINT "ENTER ANY SPECIFIC COMMENTS YOU WISH TO": PRINT "MA
     KE REGARDING THIS REPORT"
17030  PRINT "PLEASE LIMIT SENTENCES TO LESS THAN 240": PRINT "CHARACTERS
      (APPROX. 6 LINES)"
17040  PRINT "WHEN FINISHED, TYPE <RETURN>": PRINT
17050 N = 0:V = 10:H = 1: FOR I = 1 TO 100:RS$ = CM$(I): PRINT " ";RS$: GOSUB
     21000: IF RS$ = "" THEN 17080
17060 CM$(I) = RS$:N = N + 1:V = V + 1 + ( LEN (RS$) / 40): IF V > 23 THEN
     V = 23
17070  NEXT
17080  GOSUB 26000: IF RS$ = "N" THEN 17000
17090  IF RS$ = "2" THEN RS$ = "NO": GOSUB 28000
17100  RETURN
20999  REM
21000  REM *** INPUT SUBROUTINE ***
21001  REM
21010  VTAB V: HTAB H: INPUT " ";A$: IF A$ = "" THEN  RETURN
21020  IF A$ =  CHR$ (16) THEN  PR# 1: PRINT  CHR$ (9);"S": PR# 0: GOTO 2
     1000
21022  IF A$ =  CHR$ (18) THEN  GOTO 140
21025  IF A$ = "/" THEN A$ = ""
21030 RS$ = A$
21040  RETURN
21999  REM
22000  REM *** LENGTH CHECK ***
22001  REM
22010  IF  LEN (RS$) <  > B THEN  VTAB V: HTAB H: PRINT " DDMMYY  ": GOSUB
     21010: GOSUB 22010
22020  RETURN
22999  REM
23000  REM *** LIMITS CHECK ***
23001  REM
23010  IF A$ = "" THEN  RETURN
23015  IF  VAL (RS$) >  = MN THEN  IF  VAL (RS$) <  = MX THEN 23030
23020  PRINT TA$: GOSUB 21010: GOSUB 23010
23030  RETURN
23999  REM
24000  REM *** CHECK FOR CHAR. IN NUMBER STRING ***
24001  REM
24005  IF  LEN (RS$) = 0 THEN 24050
24010  FOR J = 1 TO  LEN (RS$): IF  VAL ( MID$ (RS$,J,1)) = 0 AND  MID$ (
     RS$,J,1) <  > "0" THEN 24040
24020  NEXT
24030  GOTO 24050
24040  PRINT TA$: GOSUB 21010: GOSUB 24010:
24050  RETURN
24999  REM
25000  REM *** DATE CHECK ***
25001  REM
25010  IF  VAL ( LEFT$ (RS$,2)) <  = 31 AND  VAL ( LEFT$ (RS$,2)) >  = 0 THEN
      GOTO 25030
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25020  GOTO 25060
25030  IF  VAL ( MID$ (RS$,3,2)) <  = 12 AND  VAL ( MID$ (RS$,3,2)) >  =
     0 THEN 25050
25040  GOTO 25060
25050  IF  VAL ( RIGHT$ (RS$,2)) >  = 70 THEN 25070
25060  VTAB V: HTAB H: PRINT " DDMMYY  ": GOSUB 21000: GOSUB 25000
25070  RETURN
25999  REM
26000  REM *** OK SUBROUTINE ***
26001  REM
26010  VTAB 23: HTAB 28: PRINT "OK <Y/N>";:V = 23:H = 38: GOSUB 26020: RETURN

26020  VTAB V: HTAB H: GET RS$: IF RS$ <  > "Y" THEN  IF RS$ <  > "N" THEN
      VTAB V: GOTO 26020
26030  VTAB V: HTAB 1: CALL  - 868: VTAB 22: PRINT : RETURN
26999  REM
27000  REM *** BLANK OUT ROUTINE ***
27001  REM
27010  FOR I = 1 TO BL: VTAB V: HTAB H: CALL  - 868:V = V + 1: NEXT : RETURN

27999  REM
28000  REM *** PRINT DATA ROUTINE ***
28001  REM
28010  VTAB V: HTAB H + 1: PRINT RS$: RETURN
28997  REM
28998  REM *** WINDOWED INPUT SUBROUTINE***
28999  REM
29000  POKE 33,10: POKE 32,H: POKE 34,V - 1: POKE 35,V
29010  VTAB V: HTAB 1: INPUT "";A$: IF A$ = "" THEN  GOTO 29030
29012  IF A$ =  CHR$ (16) THEN  PR# 1: PRINT  CHR$ (9);"S": PR# 0: GOTO 2
     9010
29013  IF A$ =  CHR$ (18) THEN  GOTO 140
29014  IF A$ = "/" THEN A$ = ""
29016 RS$ = A$
29030  POKE 32,0: POKE 33,40: POKE 34,0: POKE 35,23
29040  VTAB V: HTAB H + 1: PRINT RS$
29050  RETURN
29997  REM
29998  REM *** DATA STATEMENTS ***
29999  REM
30000  REM *** D0$(I) = SPECIES ***
30010  DATA  1,COHO,2,CHINOOK,3,SUMMER CHINOOK,4,FALL CHINOOK,5,SOCKEYE,6
     ,CHUM,7,PINK,8,SUMMER STEELHEAD,9,WINTER STEELHEAD,10,DOLLY,11,RAINB
     OW,12,CUTTHROAT,13,OTHER
30020  REM *** D1$(I) = AGE ***
30030  DATA  1,EGGS,2,SAC FRY,3,FRY (BUTTONED),4,ADVANCED FRY,5,YEARLING,
     6,2 YEAR,7,3 YEAR,8,4 YEAR,9,IMMATURE ADULT,10,RIPE ADULT,11,SPENT A
     DULT,12,JACK,13,OTHER
30040  REM *** D2$(I) = SEX ***
30050  DATA  1,FEMALES,2,MALES,3,MIXED,4,UNKNOWN
30060  REM *** D3$(I) = SUBMISSION REASON ***
30070  DATA  1,HATCHERY LOSS,2,FISH KILL IN WILD,3,RESEARCH,4,HEALTH CHEC
     K,5,CERTIFICATION,6,OTHER
30080  REM *** D4$(I) = STOCK ORIGIN ***
30090  DATA  1,WILD,2,CULTURED,3,SEMI-WILD,4,UNKNOWN
30100  REM *** D5$(I) = SAMPLE TYPE ***
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30110  DATA  1,LIVE,2,DEAD,3,MORIBUND,4,RANDOM,5,MIXED,6,OTHER
30120  REM *** D6$(I) = CONTAINER TYPES ***
30130  DATA  1,BURROWS,2,CIRCULAR,3,RACEWAY,4,NET PENS,5,KEEPER POND,6,TR
     OUGHS,7,CAP TROUGH,8,SPAWNING CHANNEL,9,EARTH POND,10,HEATH TRAY,11,
     GRAVEL BOX,12,NATURAL,13,OTHER
30140  REM *** D7$(I) = FOOD ***
30150  DATA  1,OMP,2,BIODIET,3,SIVERCUP,4,RANGERS,5,ABERNATHY,6,APEX,7,RE
     SEARCH,8,CUSLAN,9,NATURAL,10,NONE (STARVATION),11,OTHER
30160  REM *** D8$(I) = FOOD TYPE ***
30170  DATA  1,WET,2,DRY,3,MIXED
30180  REM *** D9$(I) = FEEDING METHOD ***
30190  DATA  1,HAND ,2,MACHINE,3,NATURAL
30200  REM *** DA$(I) = BEHAVIOR ***
30210  DATA  1,NORMAL,2,NOT FEEDING,3,ON SURFACE,4,ON OUTLET,5,SLUGGISH,6
     ,MORIBUND,7,DEAD,8,FLASHING,9,CORKSCREWING,10,OTHER
30220  REM *** DB$(I) = GROSS SYMPTOMS ***
30230  DATA      1,NORMAL,2,DARK,3,POPEYED,4,OPEN LESIONS,5,BLUE COLOUR (
     SPOTS),6,SCALE LOSS,7,HEMORRHAGING,8,FIN ROT,9,FIN EROSIONS,10,RED V
     ENT,11,RED MOUTH,12,PARASITES,13,FUNGUS,14,OTHER
30240  REM *** DC$(I) = HANDLING ***
30250  DATA   1,SORTING,2,TAGGING,3,SAMPLING,4,MOVING,5,GRADING,6,RESEARC
     H
30260  REM *** DD$(I) = VACCINATIONS ***
30270  DATA   1,YES (& DATE DONE),2,NO
30280  REM *** DE$(I) = WATER SOURCE ***
30290  DATA  1,SURFACE,2,WELL,3,RIVER,4,CITY,5,LAKE,6,SALT,7,BRACKISH
30300  REM *** DF$(I) = WATER HARDNESS ***
30310  DATA  1,EXTREMELY SOFT,2,VERY SOFT,3,SOFT,4,MODERATE,5,HARD,6,VERY
      HARD,7,EXTREMELY HARD
30320  REM *** MAIN MENU DATA ***
30330  DATA  ?,1,INPUT FOR REPORT,8,2,REVIEW OF REPORT,9,3,HARD COPY OF R
     EPORT,11,4,STORE DATA ON DISK,12,5,RECALL DATA FROM DISK,14,6,HARDCO
     PY OF BLANK FORM
30340  DATA   16,7,RETURN TO FISH HEALTH
30350  REM *** FORM LABELS ***
30360  DATA 12,5,5,1,1,5,5,1,1,9,1,9,1,1,6,12
30365  DATA  12,7,5,6,6,6,6,6,6,1,11,11,9,6,6,5,15,13,6,5,6,2,2,11,1,12,1
     1
30370  DATA 8,12,12,2,10,8,5,15,10,5,15,12,8,5,1,5
30999  REM
31000  REM *** INPUT "OTHER" DATA SUBROUTINE ***
31001  REM
31002 J = 0
31020 CF(1) = 13:CF(2) = 13:CF(3) = 6:CF(4) = 6:CF(5) = 13:CF(6) = 11:CF(
     7) = 10:CF(8) = 14
31030  IF A$ = "" AND  VAL (RR$) = CF(XC) THEN  VTAB V: HTAB H: CALL  - 8
     68:RS$ = XD$(XC): RETURN
31040  IF  VAL (RR$) <  > CF(XC) THEN  RETURN
31045 PF = 1
31050  VTAB V: HTAB H + 1: CALL  - 868
31060  VTAB 23: CALL  - 868: VTAB 23: HTAB 5: PRINT "USE SEMICOLONS,";: INVERSE : VTAB 23:
31061  IF XC = 2 THEN  VTAB 12: HTAB 24: PRINT "2  SAC FRY"
31070  VTAB V: HTAB H + 1: INPUT "";XD$(XC)
31075  VTAB 23: HTAB 5: CALL  - 868
31080  FOR I = 1 TO  LEN (XD$(XC))
31090 RT$ =  MID$ (XD$(XC),I,1)
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31095 RU$ = ""
31100  IF I <  LEN (XD$(XC)) THEN RU$ =  MID$ (XD$(XC),I + 1,1)
31110  IF  VAL (RT$) <  > 0 OR RT$ = "0" THEN J = J + 1:SS$(J) = RT$: IF
      VAL (RU$) <  > 0 OR RU$ = "0" THEN SS$(J) = SS$(J) + RU$:I = I + 1
31120  NEXT
31140  IF J = 0 THEN XFLAG = 1:RS$ = XD$(XC): RETURN
31150 RS$ = ""
31160  ON XC GOTO 31200,31210,31220,31230,31240,31250,31260,31270
31200  FOR I = 1 TO J:SS(I) =  VAL (SS$(I)):RS$ = RS$ + D0$(SS(I)) + "; "
     : NEXT : GOTO 31300
31210  FOR I = 1 TO J:SS(I) =  VAL (SS$(I)):RS$ = RS$ + D1$(SS(I)) + "; "
     : NEXT : GOTO 31300
31220  FOR I = 1 TO J:SS(I) =  VAL (SS$(I)):RS$ = RS$ + D3$(SS(I)) + "; "
     : NEXT : GOTO 31300
31230  FOR I = 1 TO J:SS(I) =  VAL (SS$(I)):RS$ = RS$ + D5$(SS(I)) + "; "
     : NEXT : GOTO 31300
31240  FOR I = 1 TO J:SS(I) =  VAL (SS$(I)):RS$ = RS$ + D6$(SS(I)) + "; "
     : NEXT : GOTO 31300
31250  FOR I = 1 TO J:SS(I) =  VAL (SS$(I)):RS$ = RS$ + D7$(SS(I)) + "; "
     : NEXT : GOTO 31300
31260  FOR I = 1 TO J:SS(I) =  VAL (SS$(I)):RS$ = RS$ + DA$(SS(I)) + "; "
     : NEXT : GOTO 31300
31270  FOR I = 1 TO J:SS(I) =  VAL (SS$(I)):RS$ = RS$ + DB$(SS(I)) + "; "
     : NEXT : GOTO 31300
31300 I =  LEN (RS$):RS$ =  LEFT$ (RS$,I - 2):XD$(XC) = RS$:XFLAG = 1: RETURN

32030  IF A$ = "" AND  VAL (RR$) = CF(XC) THEN  VTAB V: HTAB H: CALL  - 8
    68:RS$ = XD$(XC): RETURN
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POOR

QUALITY

ORIGINAL